

INDIAN SCHOOL OF MINES
DHANBAD
1976-77

C. K. V.
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COMPILED

ANNUAL REPORT

1976-77

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Indian School of Mines
Dhanbad - 826004



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Indian School of Yoga
Mumbai-400001

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I | *General*

General

1 INTRODUCTION:

1.1 The year of 1976 - 77 would be written in golden letters in the history of the Indian School of Mines, not only because it happens to be the year of the Schools' Golden Jubilee, but also because in no other year did the School undertake such a diversified programme of activity as during this year. The record number of seminars, short-term courses, consultancy projects and the very high level of interaction with the Industry stand out as a standing testimony for this tall statement. Credit for this achievement goes to all sectors of the ISM community, the student body, the teachers and other members of the ISM staff who worked whole-heartedly and in full co-operation in the various programmes to make 1976 - 77 a memorable year. Incidentally, the School completed ten years of its functioning as a University during the current year.

Syed Asadullah, President/North Coal Department/Afghanistan, Shri K S R Chari, Secretary to the Govt of India/Ministry of Energy/Department of Coal, Prof Satish Chandra, Chairman/University Grants Commission, and Prof B D Nag Choudhary, Vice-Chancellor/Jawaharlal Nehru University, were among the distinguished luminaries, who visited the School during the year.

1.2 The Institute which was started in 1926 on the lines of the Royal School of Mines/London has had its own share of ups and downs since then. Over this 50-year long span however the Indian School of Mines has grown to become a leading centre of learning in the area of mineral sciences and technology. What is even more remarkable is that this development has resulted mainly from the School's own efforts without any substantial foreign aid or collaboration. ISM can therefore be called as a truly swadeshi institution which is fast becoming an active centre of dialogue and interaction between the various agencies and industries involved and engaged in the extraction and processing of mineral resources from the mother Earth.

1.3 The School acknowledges with thanks and expresses its gratitude to the Department of Coal of the Union Ministry of Energy, for providing the sizeable allocation of Rs. 317 lakhs to push through an ambitious V Five-Year Plan devoted to consolidation and development. Together with the sum of Rs. 60 lakhs allocated by the Ministry of Education and Social Welfare, the total available funds of Rs. 377 lakhs are being utilised (1) to augment the highly inadequate physical facilities

in terms of buildings and equipments and (2) to diversify the academic effort. This munificent allocation and facilities generated therefore, would no doubt constitute a landmark in its chequered history as the School enters the second half-century of its existence.

With a distinguished array of illustrious alumni occupying top positions in large number of private and public sector organisations dealing with the minerals sector, the ISM community rededicates itself during its Golden Jubilee year, to the service of the Nation; and it is in this spirit that the following review of its activities during the year from July 1, 1976 to June 30, 1977 is presented.

2 UNDERGRADUATE PROGRAMMES

2.1 Fashioned on the model of the (London) Royal School of Mines, ISM was set up in 1926 as a subordinate office of the Government of India. It was affiliated from 1958, successively to the Bihar and the Ranchi Universities, to enable its graduates to be awarded University degrees. It became 'deemed' to be an University in July 1967 by a notification issued by the Govt of India in exercise of powers vested under Section 3 of the University Grants Commission Act. 1956. Since then, the School has been awarding its own degrees right up to the Ph.D Level. While the integrated programme in Mining (Engg) and (Applied) Geology has been run at the School since its very inception, it started two new programmes, in Petroleum Engg and Applied Geophysics, in 1957. On the basis of a recommendation of the interministerial Joint Board for Mining Engg Education and Training, a 3-year Condensed Degree programme for the benefit of diploma-holders in Mining was also started in 1973.

2.2 Currently, the following programmes are run at the School at the under-graduate level :

1. B Tech (Min Engg)
2. B Tech (Pet Engg)
3. B Sc (Hons)/M Sc (Appl Geol)
4. B Sc/M Sc (Appl Geoph)

Through a 5-year integrated programme with provision for lateral entry at 3rd year level for the App Geol and App Geophy disciplines

(3)

5. B Tech (Min Engg) condensed degree programme

{ Holders of diploma in Mining are admitted to a 3-year version, joining the 5-year stream at the IV year level.

Admission to these programmes is made entirely on merit on the basis of performance in an All-India Entrance Examination held specially for the purpose. In May 1977, this examination was held at 26 centres for the 5-year programme and at four centres for the Condensed Degree programme. Only those who have passed the Higher Secondary/Pre-University (or equivalent) examination in English, Physics, Chemistry, Mathematics as their subjects of study, are eligible to appear in the entrance examination for the 5-year programme. A limited number of rank-holders in the Higher Secondary Pre-University/Intermediate examinations were also admitted directly. In the Entrance Examination for the Condensed Degree programmes, only those who possess a Diploma in Mining were eligible to appear.

Some 'make-up' admission is also made to the III year of the App Geophysics and App Geology programmes from amongst holders of the first degree with Physics, Chemistry and Mathematics, and Geology respectively. At the end of the III year, a B Sc (Hons) degree in the Applied Geology programme and a B Sc degree in the Applied Geophysics programme is awarded.

2.3.1 Due to recession in the mineral industry in the early 1960's the intake in Mining Engineering was reduced from 90 per year to 25 in 1964-65. With the spurt in mining activity after the oil crisis, this was increased to 35 in 1973-74 and to 60 in 1974-75. This strength is being maintained; there is an additional quota of 20 for the condensed version. It may be mentioned here that ISM has the largest intake in Mining Engg in the country.

The intake in Petroleum Engg which was reduced from 20 to 10 ten years ago was raised to 15 in 1974-75, which figure is being maintained. The sanctioned annual intake into the other undergraduate programmes at the school, i. e., App Geology and App Geophysics also is 15 each, down from 20 each earlier. Of the Pet Engg seats, one is reserved for a nominee of the Assam Government and one for meat of the Gurat Government. Foreign students are admitted outside the figures mentioned above.

(4)

2.3.2 Since 1973, 20% of seats in each discipline are offered to SC/ST students, irrespective of their performance in the Entrance Examination, offers for admission are being made on the basis of separate merit lists of SC/ST students. In order to help them in their performance in the Entrance Examination, residential preparatory classes are being arranged for SC/ST students since 1974. Even after admission, make-up classes are held for these students in the subjects in which they are weak.

As a result of these efforts, the wastage amongst SC/ST students which was as high as 50% in the earlier years, has come down considerably.

2.3.3 The change-over to the 10+2 pattern of secondary education created a new situation, in as much as the AICTE decided that from amongst the students selected on the basis of the Entrance Examination, those having passed the plus-2 stage, might be admitted to the II year if they clear another special test. To enable this to be done from the next year it was decided to leave about a third of the seats unfilled at I year level during 1976-77.

2.4.1 A total of 3223 candidates were registered for the Entrance Examination held at 26 centres all over the country, out of which 2686 candidates appeared for the examination. Though 373 students qualified, admissions had to be limited to only 70 candidates as the remaining 35 seats were kept vacant for II year admission of those who pass the plus-2 stage of the new Higher Secondary Education System. Offers were sent to 143 candidates. 11 scheduled caste and 7 scheduled tribes candidates were also offered admission, although 15 of them had not fulfilled the prescribed requirements. An All-India written Entrance Examination was also held in May 1977 for direct make up admission to the 3rd year of the App Geophysics programme. 66 candidates took the examination at 20 different centres out of them seven qualified for admission.

2.4.2 The number of students actually admitted in the I year class during 1976-77 was 56 : the statewise distribution is given below :

State	No.	State	No.
Assam	5	Tamil Nadu	1
Bihar	10	Nagaland	1
Gujrat	1	U. P.	1
W. Bengal	30	Karnataka	1
Orissa	4	Delhi	2

TEN YEARS AT A GLANCE OF ISM AS A UNIVERSITY

FIG. 1 STUDENTS POPULATION

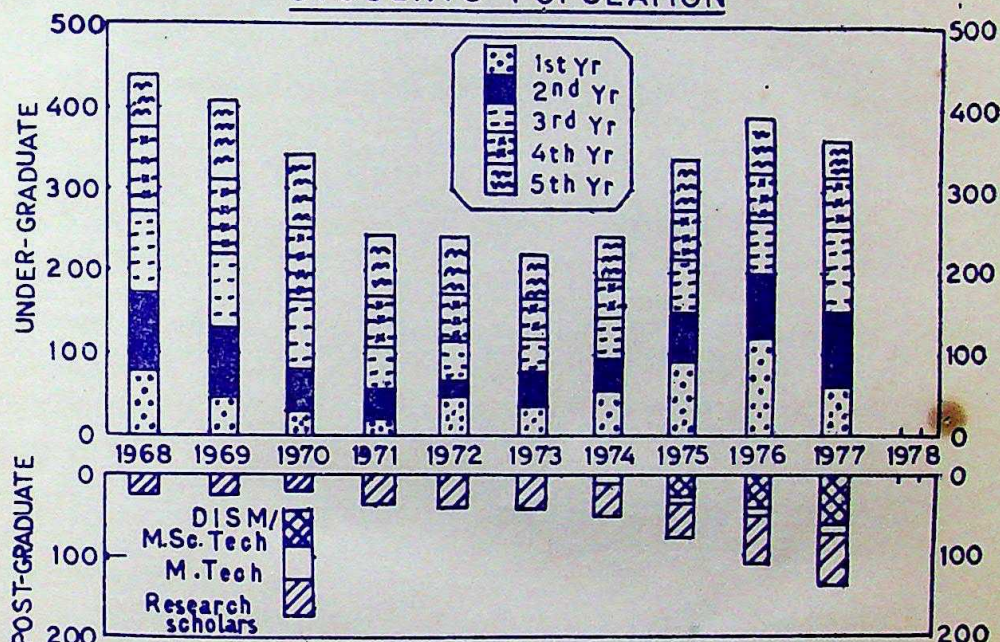
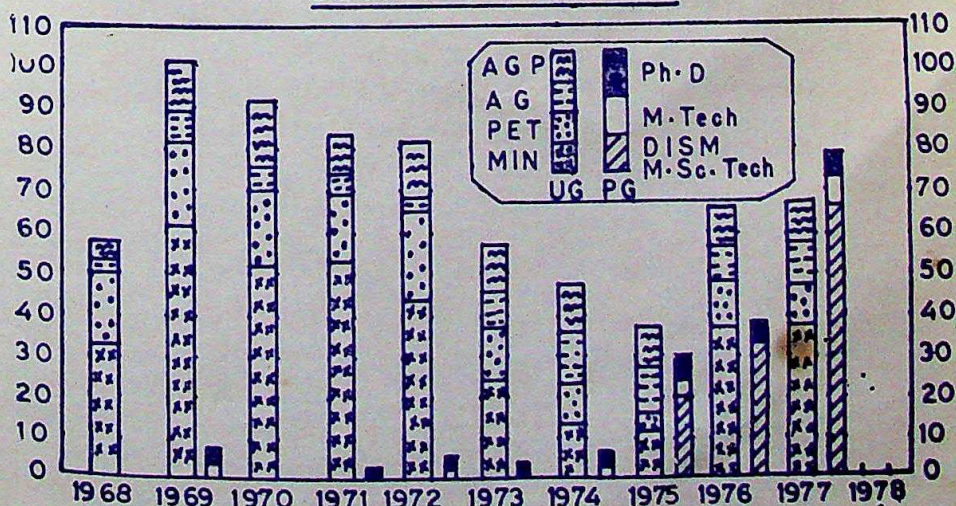


FIG. 2 DEGREES AWARDED



(5)

In addition, seven foreign students joined, including two from Iran.

In the academic session 1976-77, no admission was made into B Tech (Min Engg) condensed programme due to comparatively poor response. Seven students were admitted directly to the III year of the App Geology programme, and another seven to that of the App Geophysics programme.

2.5 The total student population in the programmes during 1976-77 as on 1. 3. 1977, is given below :

Brnrch	I yr	II yr	III yr	IV yr	V yr	Total
B Tech (Min Eng)	33	61	65	45	29	233
B Tech (Pet Eng)	10	14	11	7	9	51
M Sc (App Geol)	13	7	13	12	7	52
M Sc (App Geoph)	7	5	10	3	8	33
Total	63	87	99	67	53	369

This figure of 369 includes 34 scheduled caste and 15 scheduled tribe students; as also 5 students admitted against the quota reserved for the states of Assam and Gujrat for the B Tech (Pet Engg) programme. This figure also includes 18 foreign students — 1 from Bhutan, 5 from Nepal 10 from Bangladesh and 2 from Iran.

The student population at the School since it received University status in 1967, is shown in Figure 1.

2.6 The results of undergraduate programme of 1976-77 session is summarised below :

Examination	Number of students				
	Appeared	Passed in I Div	Passed in II Div	Pased	Failed
B Sc (App Geoph)	9	5	1	2	1
B Sc (Hons) (App Geol)	12	7	5	-	-
B Tech (Min Engg) Pt I	45	27	17	1	-
B Tech (Pet Engg) Pt I	7	7	-	-	-
M Sc (App Geoph) Pt I	3	3	-	-	-
M Sc (App Geol) Pt I	12	11	1	-	-
B Tech (Min Engg) Pt II	29	21	8	-	-
B Tech (Pet Engg) Pt II	8	7	1	-	-
M Sc (App Geoph) Pt II	7	6	1	-	-
M Sc (App Geol) Pt II	7	6	1	-	-

Figure 2 shows the number of degrees awarded by the School since it received University status ten years ago.

(6)

3. POST-GRADUATE PROGRAMME

3.1 The year under review saw further expansion in the post-graduate activity of the School. Besides earlier programmes leading to the award of the degrees of M Tech (Mining and Mine Planning), M Tech (Opencast Mining), M Tech (Min Machinery) Part-time, and the One-year post-graduate (sandwich pattern) programme in Coal Mining Machinery, the year saw introduction of following new postgraduate programmes :

- ★ One year M Sc Tech (Mineral Exploration)
- ★ One year M Sc Tech (Min Geoph)
- ★ One/two year DISM/M tech (Coal/Mineral Beneficiation) since then renamed as Mineral Engg.

A brief review of the postgraduate programmes are given in the following Paragraphs.

3.1.1 With the continuously increasing technological sophistication in mining methods and advances in mechanisation for improving the productivity of mines, particularly after nationalisation, there is a growig need for developing expertise in mining as well as mine-planning. To satisfy this need, an Industry oriented M Tech programme in Mining was started in 1972-73. The course is being reviewed and updated from time to time in consultation with industry.

3.1.2 In India about 20% of the coal output and about 80% of the production of other minerals is coming from opencast mines. A much larger percentage of additional production of coal and copper-ore would come from opencast mining. There is however no institute in the country which runs a programme specially designed for opencast mining. To fill this gap, an M Tech programme in opencast mining was started in 1975-76 (with the assistance of Tata Steel who instituted a Chair in opencast mining for a 3-year period at the School for civil, mechanical and mining engineers and also for holders of M Sc in App Geology. The response for admissin to this programme in its I year was not satisfactory and only one student was admitted last year. This was perhaps on account of the restriction that all those having qualifications other than mining should have atleast three years approved experience in opencast mining, and must be sponsored. The issue was considered by the Academic Council at its meeting held on 27. 1. 1976, when it reduced the training period to one year and also approved the admission of non-sponsored candidates to the programme.

(7)

3.1.3 As a special service for BCCL, the School is running from Jan 1974, a special one-year sandwich pattern postgraduate programme in Coal Mining Machinery. This activity soon generated interest, amongst the growing BCCL mech'elec engineering cadres, in postgraduate studies in this area of mining machinery. With UGC approval, a first batch of 13 students was admitted to a new M Tech (Min Machinery) Part-time programme in Jan, 1976, This 3-year evening programme is being offered by the Deptt of Eng and Mining Machinery for in-service electrical, mechanical and mining engineers, mostly employed with Bharat Coking Coal Ltd. in the Jharia Coalfield. In addition, the Engg and Mining Machinery Deptt. continues to offer the one-year sandwich pattern post-graduate programme in Coal Mining Machinery to the graduates in electrical/mechanical engineering recruited by the Bharat Coking Coal Ltd., The batch admitted in January, 1977 included JET's from other CIL coal companies as well.

3.1.4 The two one-year postgraduate courses leading to the M Sc Tech degrees in mineral Exploration and mining geophysics, introduced by the Deptts. of App Geology and App Geophysics respectively, were sanctioned during the IV plan but could not be started earlier due to several constraints and difficulties. The response to these courses which were started this year, was very good, and a total of 15 students were admitted to the two courses.

3.1.5 In response to increasing demands from the Industry, a post-graduate DISM/M Tech programme in mineral engineering for electrical/mechanical/mining/metallurgical/chemical engineers and holders of M Sc degrees in Geology and App Chemistry was also started during the current year. The programme attracted 37 applications; admission was offered to seven candidates including a sponsored one.

3.2 The total student strength of post-graduate programmes at the School during 1976-77 was 87, as detailed below :

Sl. No.	P r o g r a m m e	Total strength
1.	M Tech (Min and Mine Planning)	3
2.	M Tech (Opencast Mining)	3
3.	One-year PG programme in Coal Mining Machinery (Batch going out on 31.12.1976)	46
4.	M Tech (Min Machinery) Part-time	13
5.	M Sc Tech (Mineral Exploration)	10
6.	M Sc Tech (Min Geophysics)	5
7.	DISM M Tech (Mineral Eng)	7

The number of postgraduate students who successfully completed these programmes during 1976-77 was 61 as detailed in Annexure II (A).

3.3.1 In 1976-77, There were 38 (Full-time) Research Scholars registered for the grant of M Tech (Research) and Ph D degrees. The discipline-wise distribution is given below :

Min Engg	= 1	App Geophysics	= 9
Pet Engg	= 3	Chemistry and	= 6
Engg &	= 2	Mineral Engg	
Min Machinery		Physics	= 3
App Geology	= 11	Mathematics	= 3

3.3.2 In addition 29 inservice scientists/engineers were registered for the grant of M Tech (Research) and Ph D degrees as external candidates during 1976-77, taking the total number up to 95, with the following discipline-wise distribution :

Min Engg	= 22	App Geophysics	= 15
Pet Engg	= 9	Chemistry &	= 20
Engg & Min	= 3	Fuel/Mineral Engg	
Machinery		Physics	= 4
App Geology	= 20	Mathematics	= 2

3.3.3 During the year, five Ph D degrees were awarded, bringing the total of Ph D s awarded by ISM to 22. One candidate was awarded M Tech by Research during the year, taking the total number of such degrees awarded to 5.

3.5 With effect from 1976-77 the Govt. of India approved the ISM Deptt of Mining Engg as an appoved centre for Quality Improvement Programme, for college and university teachers to enable them to study for M Tech/Ph D programmes in Mining Engg. School is also approved by UGC as a QIP Centre for college teachers in science.

4. ACADEMIC MANAGEMENT

4.1 Semester System

As per the historic decision taken by the Academic Council at its meeting held on 25. 6. 76 the Semester System (along with Internal Assessment and Grading) was introduced in 1976-77 for the I and II year classes. However, due to certain difficulties that emerged in respect of its implementation for the II year class which had followed the conventional system in the I year, it was later on decided to accept the request of II year students to go back to the conventional system.

It would now take four years more for the semester system to extend to the whole of the 5-year intergrated programme. The implementation of the change involves reseheduling of subjects, changing their relative weightage and formulation of the fresh rules for examinations, marks being replaced by grades based on credit hours. As a large number of teachers were not familiar with the new system, a 2-day workshop in Grading and Internal Assessment was organised on Nov. 23-24 1976, with the assistance of Prof V Natarajan, of the Association of Indian Universities.

4.2 Academic calendar

The change aforesaid also meant two separate Academic Calendars, one for classes following the conventional system and another for those following the Semester System, The two calendars as followed are reproduced at Annexures III(A) and III(B).

4.3 Curricula Development

As a part of continuous review and updating of the course content of various academic programmes, the School (in consultation with representatives of the Industry and user organisations on the various Boards of courses and studies) initiated action during 1976-77 on major restructuring of all undergraduate and postgraduate programmes, and the exercise is being continued. The objective of this comprehensive curriculam development effort is to make the ISM product more acceptable and relevant to the fast-changing environment and technology in the country.

During this exercise, an attempt is also made to reduce the formal lecture-content of various courses and to promote self study; as also to reduce and rationalise the number of subject-papers studied. In fact, the formal weekly lecture-load has been brought down over the past three years by an average of four hours. On the other hand, as a rationalisation of the Academic Calendar, the average learning period has been increased by 6-7 weeks, to abut 30. This is expected to increase further to about 33-34 weeks, with the introduction of the Semester System.

4.4 Teaching Performance

The teaching load during year amounted to 11,265 lectures and 5,631 practicals and tutorials, compared to 9,142 and 5,159 hrs respectively last year department-wise breakdown is given below :

(10)

Name of the Department	No. of Lectures	No. of Practicals and tutorials etc.
1. App Geology	1378	1903
2. App Geophysics	600	613
3. Chem Fuel & Metallurgy	1022	902
4. Engg & Min Machinery	882	790
5. Humanities & Social Science	1030	902
6. Industrial Engg & Management	694	406
7. Min Engg	1608	462
8. Pet Engg	1716	188

Besides, as a part of the course work, regular field trips, excursions and vocational/practical training programmes were organised. Details of these programmes are given in Part-II of the Report,

4.5 Assistance to weaker students

For the benefit of schedule caste and schedule tribe candidates who had applied for the Entrance Examination, special coaching classes in English, Physics, Mathematics and Chemistry were held for a period of over six weeks. In addition more than 110 special make-up classes were conducted at the I year level for the weaker and backward section students.

4.6 Examinations

As stated in earlier Annual Reports, all examinations at the School have been centralised since 1974. Arrangements were made during the year to conduct 242 theory examinations and 69 practical examinations relating to the annual examinations of 1976-77. In all, a total of 147 examiners were appointed for setting question papers and for evaluating answer books. To maintain secrecy, coding was introduced for all answer scripts except those for I and II years and III year Min and Pet engg. For declaring the results of annual and supplementary examinations of 1976-77, the Moderation and Examination Boards met on 69 and 26 occasions respectively.

5 CONTINUING EDUCATION PROGRAMME

5.1 In order to meet the needs of the mineral and allied industries in respect of continuing education and training of inservice personnel, the School has developed a comprehensive programme of short-term (1-3 week) intensive courses in nearly 40 functional areas of relevance to these industries, covering a very broad spectrum of topic-range and

several participant-levels. For most of these programmes which are organised *in campus*, guest inputs are also arranged from other educational/research/professional institutes and bodies (like NITIE/Bombay, NPC/Delhi, XLRI/Jamshedpur, CFRI/Digwadih and CMRS/Dhanbad), the Directorate-General of Mines Safety as well as the industry itself - including CMPDI, BCCL, ECL, CCL, WCL, CIL, MAMC, etc.

The executive development programme activity at ISM has developed fairly fast since its start in 1973, as may be seen by the following figures

Year	Numbers of Courses run	Participant-weeks
1973	3+0*	210
1974	6+3	295
1975	12+2	760
1976	15+7	1250

(*Off-campus courses - see below)

Recognising the importance of the activity, U G C had sanctioned, in 1975, a post of Professor of Continuing Education at the School; and this has helped considerably in putting this activity on a solid footing.

5.2 Tailor-made short courses, specially designed *on demand* for industrial and other clients, are also run both at the premises of the client and at the School itself. Such courses have so far been run for Assam Oil Ltd., Indian Explosives Ltd., Bharat Coking Coal Ltd. IDL Chemicals Ltd., Eastern Coalfields Ltd., Singareni Collieries Co Ltd., Hindustan Zinc Ltd., Hindustan Copper Ltd., Mining Engineers Association (Goa Branch), and the Western Coalfields Ltd.

The subjects already covered include Introduction to Mining/ Coal Mining/Mining Machinery, Winding in Coal Mines, Advanced Mine Surveying, Opencast Mining, Mining Technology, Rock Mechanics, Design of Longwall Mining Systems, Ventilation Planning, Mine Design, Stowing Plant Design, Environmental Engg, Operations Research etc.

The growth of this activity** is indicated by the following figures :

(12)

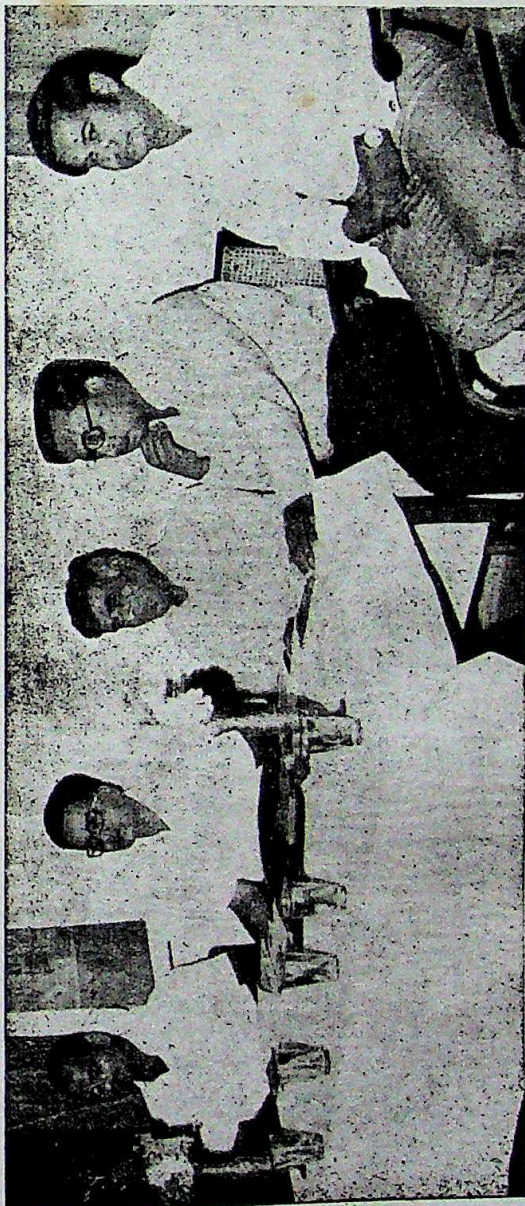
Year	Number of Off-campus Courses	Number of on-demand tailor-made in-campus courses
1973	Nil	1
1974	3	2
1975	2	4
1976	7	2

** These figures are included in those given in para 5.1

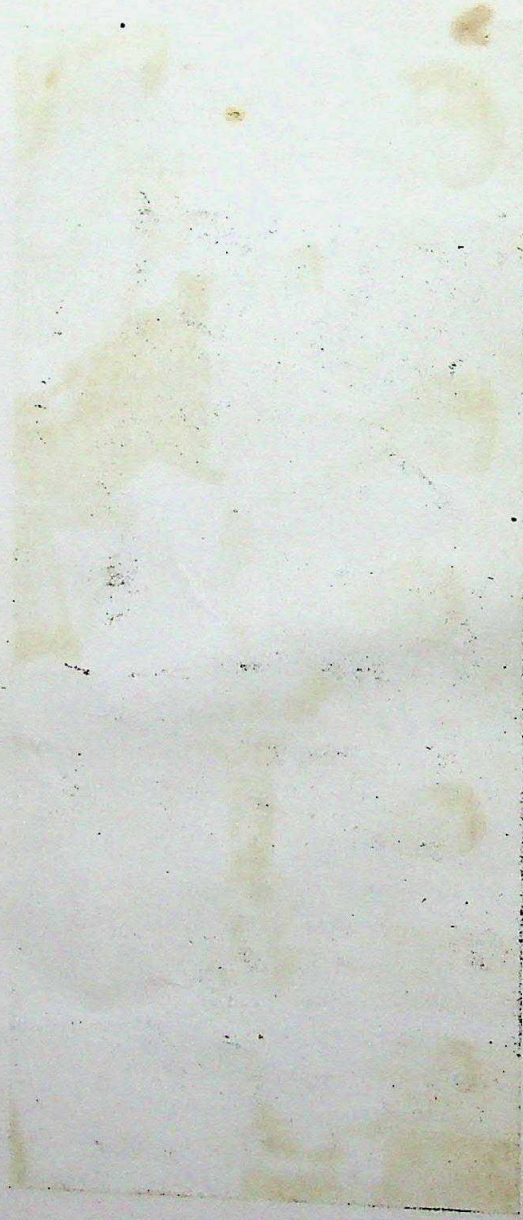
5.3 During 1976-77, the following short courses were organised In-Campus :

Name of Courses	Duration (weeks)	Sponsored by
1 Mathematical & Statistical Techniques for Mining Industry-II	2	Open
2 P G Cert. Course on Productivity Techniques in Mining	12	Open
3 Mine Environmental Engg-III	2	Open
4 Opencast Mining & Machinery	2	Open
5 Coal Preparation Washery Techniques-II	2	Open
6 Opencast Mining	2	Open
7 Mining for Non-Mining Executives - III	1	Open
8 PG Cert. Programme on Mine Project Management	12	Open
9 Solid Earth Geophysics (UGC-GJ Activity)	2	Open (College Teachers only)
10 Intensive Programme on Mine Surveying	6	Bharat Coking Coal Ltd
11 Refresher Course in Petroleum Technology-II	13	Oil & Natural Gas Comm.
12 Geotechniques in Earth Sciences (UGC Programme)	3	Open (College Teachers only)
13 Intensive Course in Mining Technology	4	Bharat Coking Coal Ltd

VALEDICTORY FUNCTION OF THE COURSE ON ROCK MECHANICS
AT ZAWAR MINES



From L to R : Shri V P Singh, Shri M Dutta (Dy G M, HZL), Shri R P Kapoor (CMD, HZL),
Prof A K Ghose and Prof S K Bordia.



(13)

- | | | | |
|----|---|---|------|
| 14 | Mathematical & Statistical Techniques in Mining-III | 2 | Open |
| 15 | Material Handling Systems | 1 | Open |

In addition, the following Off-Campus courses were organised :

	Name of course	Location	Duration (days)	Sponsored by
1	Winding in Coal Mines	Ukhre	3	Eastern Coalfields Ltd
2	Mining for Non-Mining Executives	Hydrabad	4	IDL Chemicals Ltd
3	Rock Mechanics applied to Hard Rock	Zawar Mines	6	Hindustan Zinc Ltd
4	Winding in Coal Mines	Satgram	3	Eastern Coalfields Ltd
5	Maintenance of Mining Machinery (in collaboration with NPC)	Calcutta	4	Open
6	Mine Surveying	Kustore	13	Bharat Coking Coal Ltd
7	Opencast Mining	Chirimiri	6	Western Coalfields Ltd
8	Design of Longwall Systems	Chandrapur	6	Western Coalfields Ltd
9	Mineral Engineering	Khetri	14	Hindustan Copper Ltd

5.4 During the year, School commissioned a new wing (consisting of a Lecture Room, a Lounge, a Dining Room and Kitchen facilities, as also an office for the caretaker) to the old 24-room 'L-shaped Hostel' which is being temporarily used as the ISM Executive Development Centre. The wing was declared open by Shri R N Sharma, Vice Chairman-cum-Managing Director, BCCL, on Oct 11, 1976. With the commissioning of this wing, the course participants now get better living facilities and amenities.

5.5 Prof S K Bordia, Professor of Continuing Education (and Technical Secretary to Director) was elected a member of the Bihar State Centre Executive Committee of the Institution of Engineers (India). The following are his other academic activities :

Publications :

- 1 "Dhanbad-The Hub of India's Mineral Industry" (ISM Golden Jubilee Interdisciplinary Seminar on Mineral Development in Eastern India, Dhanbad, Dec, 1976)

(14)

- 2 "Rock Mechanics Aspects of Thick Seam Mining" (ISM Golden Jubilee International Symposium in Thick Seam Mining, Dhanbad, Mar 1977)

Consultancy Projects :

- 1 Slope stability at Meghataburu Iron-Ore Opencast Mine
- 2 Ground vibration due to deep-hole blasting at Chasnala Colliery
- 3 Ground vibration studies at Bahula Colliery
- 4 Site investigation of Barakar Bridge, Phases - IV & V.
- 5 Site investigation at Telmuchy Bridge, Phases - II & III

Participation in Seminars, Conferences, etc :

- 1 Colloquium on "Explosives" organised by the Institution of Engineers (India) Dhanbad Sub-Centre, Dhanbad, Jul, 1976
- 2 ISM Golden Jubilee Interdisciplinary Seminar on "Mineral Development in Eastern India", Dhanbad, Dec, 1976
- 3 Mini-Seminar on Hindi Terminology, ISM. Dhanbad, Jan 1977
- 4 ISM Golden Jubilee International Symposium on Thick Seam Mining, Dhanbad, Mar 1977

6. DEVELOPMENTAL ACTIVITY

6.1 As mentioned earlier, the Central Ministry of Energy/Department of Coal has magnanimously sanctioned a liberal grant of Rs. 317 lakhs to help meet the cost of School's development during the V Plan. With this background, a Visiting Committee of the UGC had screened the School's Development Plan in Augst 1975. Its report, after approval by the Commission, was Communicated to the School in Jul 1976. The Report is reproduced at annexure II,

6.2 The position, as on 30.6.77, of the various major buildings under construction is given below :

Sl. No.	Name of the Building	Estimated Amount (in lakhs)	Position
1	Mineral Dressing Lab	11.13	Work completed and building occupied
2	7th Well Pump House O H Tank	6.2	Well is nearing completion. O H Tank is nearly half built

(15)

3	Science Block	30.6	Work started in Feb 1977
4	Bus Garage	1.97	Work started in Mar 1977
5	24 CPWD type II Qrs	12.1	Work for construction of 4 Qrs started in Mar 77 and 20 Qrs in May 1977
6	200-seat Student Hostel	32.9	Work started in May 1977
7	20 Type I (UGC) Qrs	31.12	Work expected to be started soon
8	Guest House-cum-Teachers Club	11.49	Work awarded
9	Store Block	4.30	Work not yet started
10	Ten Roomed Servant's Qrs	1.85	Work expected to start soon
11	Ring Road	13.54	Not yet started
12	Humanities Block with 250-seat (Golden Jubilee) Lecture Theatre	13.07	Not yet started

During the period under review, additional equipment worth about Rs. 12 lakhs has been purchased for the different laboratories, etc.

6.3 During the year, the new Department of Industrial Engg & Managment started on 1.1.1976, with just one Professor, got strengthened by one Asstt Professor and one Lecturer, organised there 3-month post-graduate certificate courses during the year. It is clear from the feedback received that there is real need for a regular postgraduate DISM/M Tech programme in Industrial Management oriented to the needs of the mineral industries. The proposed time-table for phasing out the new academic programmes is given below :

Department	1977-78	1978-79
Mining Engg	M Tech (Mining) Part-time*	Advaaced Diploma in Mine Surveying
Applied Geology	—	M Sc Tech (Engg Geology)
Applied Geophysics	—	—

(16)

Petroleum Engg	—	M Tech (Petroleum* Production)
	—	M Sc Tech (Petro- leum Exploration)*
Engg & Mining Machinery	B Tech (Mining Machinery) Condensed Course —Also regular Course*	Advanced Diploma in Drilling Engg
Chemistry, Fuel & Metallurgy	—	DISM/M Tech (Fuel Tech)
Industrial Engg & Management	DISM/M Tech (Industrial Management)	

*UGC approval expected by then.

7 RESEARCH AND DEVELOPMENT

Centre of Study in Mine System Design :

7.1 The Centre of Study in Mine System Design continued its efforts to develop expertise in the areas of Mine Support and Pillar-Design, Sandstowing Sub-System, Ventilation Sub-System, Transport Sub-System (both surface and below-ground), Communications sub-System, Mine-Layout Sub-System, as well as Emergency Organisation Sub-System, etc.

Research and Development :

7.2 ISM has 43 fellowships of its own now an annual research budget of Rs. 1.60 lakhs. Following are the areas in which the School is presently devoting attention in the R & D field :

- * Mine Methods and System : Open-Pit Planning and Design ; Rock Mechanics ; Stability of Ground ; Mine Workings and Mine Slopes ; Assesment of Environmental problems in Mining ; Problems of Transport; Drainage and Corrosion; Mineral Beneficiaton;
- * Rheology of Waxy and Viscous fluids ; Sand Control in Oil/Gas Wells ; Hydrate problems in h. p. Gas Transmisson System ; well Stimulation ; and Secondary Recovery Methods ;
- * Mineral Exploration ; Economic Geology ; Structure and Techtonics of Mineralised Zones ; Geophysical, Thermal, Gravity and Magnetic Surveys ; Studies in the field of Paleomagnetism and Geodynamics ; Development of Seismic and Electrical Methodology for Geohydrological problems ;

- * Development of Electronic Instrumentation ; Electronic Drives and Controls ; Workshop Layouts and Maintenance Systems.
- * Prevention of Corrosion.

In recent years, ISM has taken big strides in augmenting its research facilities and in increasing its research output. During the year, ISM had 10 CSIR Fellows, 8 UGC Fellows, 20 ISM Fellows and 5 other Fellows (attached to various sponsored projects). In addition to these fellowships, CSIR and UGC have been supporting ISM research effort through research assistance to individual teachers, etc. One such recently-sanctioned CSIR project is "Corrosion on Prevention of underground mining equipment and accessories".

Special UGC Grants for research in Geology and Geophysics :

7.4 The UGC have also recently sanctioned 3 Senior Research Fellowships and 15 Junior Research Fellowships for nine specific research projects three in the Deptt of Applied Geology, four in the Deptt of Applied Geophysics and two interdisciplinary ones. Work on most of these projects has already started.

International Collaboration

7.5 In pursuance of item 12 of the Indo-Polish Cultural agreement for 1975/76, the following programme for exchange visits by teachers between Indian School of Mines and the Krakow Academy of Mining and Metallurgy (which is also known as the Stanislaw Staszic Technical University) was implemented during the year :

<u>Name</u>	<u>Subject of interest</u>	<u>Dates</u>
1. Prof S P Banerjee	Mining Environment	10. 1. 77 to 9. 2. 77
2. Prof J N Chakraborty	Coal Preparation	10. 1. 77 to 8. 2. 77
3. Prof R D Singh	Mine Planning and Reconstruction Methods of Thick Seam Mining; Ground Control and subsidence	14. 3. 77 to 10. 4. 77
4. Prof A K Ghose	Mine Mechanisations	14. 3. 77 to 14. 4. 77
5. Shri D K Mittra	Power Electrification and Instrumentation	17. 1. 77 to 9. 2. 77
6. Prof K R M Rao	Mine Mechanisation Mine Electrical	28. 3. 77 to 11. 4. 77

(18)

- | | | |
|--------------------|---|------------------------|
| 7. Prof S K Bordia | Metalliferous Mining/
Rock Mechanics | 28. 3. 77 to 11. 4. 77 |
|--------------------|---|------------------------|

Visit from Krakow Academy of Mining and Metallurgy

- | | | |
|-------------------|---|-------------------------|
| 1. Prof T Ryncarz | Dy Director
Institute of Mining
Geomechanics | } 1. 3. 77 to 30. 3. 77 |
| 2. Prof Z Wilk | Dy Director
Research Institute
of Hydrology and
Engg Geology | |

These visits are expected to be followed by collaboration on projects of seminars, R & D, book-writing. etc., under the Indo-Polish Cultural Exchange Programme of 1977/78.

Other International Interaction

7.6.1 As mentioned in para 9.6, the Deptt of Min Engg organised, as part of the School's Golden Jubilee celebrations, an International Sumposium on 'Thick Seam Mining' on Mar 4-6, 1977 as per details given in Part II of the Report.

7.6.2 Prof R K Verma, Head, Deptt of App Geophysics, went to Hungary and Czechoslovakia during May 1976 as a part of an exchange visit organised by the UGC, and visited several geophysical institutes in these countries, as per details given in Part II of the Report.

Dr R K S Chouhan, Deptt of App Geophysics, returned in Aug 1977 after training at the Cambridge University, England.

Dr. B N P Agarwal, of the Deptt of App Geophysics. went on Post-doctoral Research Fellowship to ITC, Delft, Holland in Sep., 76.

Shri V K Srivastava, Deptt of App Geophysics, went on U S Govt Research Fellowship, to the University of St Louis and Lamont Geological Observatory, for higher studies in Geophysics, in Aug 1976.

Shri H K Mukhopadhyay of the Deptt of Pet Engg continued to pursue studies in Petroleum Engg at the University of Tulsa, USA, for his PhD.

8 INTERACTION WITH INDUSTRY

8.1 As mentioned in Section 5, the association that the School has with the mineral industry is close indeed. It runs several short courses, both in-campus and off-campus, on demand from industry, often tailored to meet specific needs. In the area of consultancy and testing services also, the School offers its expending facilities and expertise to the industry to help solve real-life problems.

8.2 Consultancy :

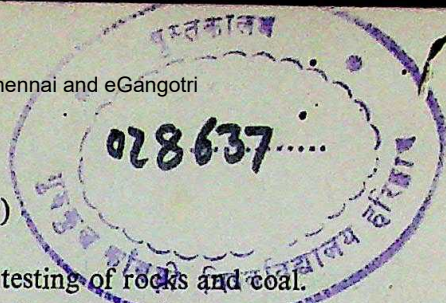
The following consultancy projects were handled by ISM faculty during the year :

Name of the Project	Sponsored by
1. Ground Water, Mineral and Other Explorations :	
1.1 Selection of Well-sites, Jalan Nagar	Hindustan Maleables and Forgings Ltd.
1.2 Selection of Well-sites Karmik Bhavan, Saraidhela	Bharat Coking Coal Ltd.
1.3 Selection of Well-sites	Hindustan Pilkington Ltd.
1.4 Location Faults and Dykes in Jarangdih Area of Bokaro Coalfields	Central Coalfields Ltd.
2. Geomechanical Investigations :	
2.1 Slope stability analysis for Meghataburu Iron-Ore Project	National Mineral Development Corporation
2.2 Ground Vibration due to deep-hole blasting at Chasnala Colliery	Indian Iron & Steel Co Ltd
2.3 Ground vibration studies at Bankola Colliery	Eastern Coalfields Ltd
2.4 Investigations into the stability of rocks at the site of New Barakar Bridge on NH-2 (Phases IV & V)	Bihar P W D
2.5 Investigations into the stability of rocks at the site of Telmuchu Bridge on NH-32 (Phases II & III)	Bihar P W D

- | | | |
|---|---|---|
| 2.6 | Drillability studies on rocks from Jhingurda project | Central Coalfields Ltd |
| 2.7 | Equivalent material model study of multi-section workings | Bharat Coking Coal Ltd |
| 3. Safety, Efficiency and Productivity : | | |
| 3.1 | Study of gassiness of Top Seam of Sawang Colliery | Central Coalfields Ltd |
| 3.2 | Preparation of manpower training and development scheme | Indian Copper Complex, Hindustan Copper Ltd |
| 3.3 | Advice on development of Industrial Engg Deptt | Eastern Coalfields Ltd |
| 3.4 | Study of Ph-value of mine water at Ena Colliery | Bharat Coking Coal Ltd |
| 4. Mineral Utilisation : | | |
| 4.1 | Study of Pozzolona clays for cement making | West Bengal Mineral Development and Trading Corporation |
| 4.2 | Beneficiation studies on quartzite gravel | Engineering Projects (India) Ltd |
| 5. System Design and Feasibility : | | |
| 5.1 | Scrutiny of detailed project report of Chapri Open Pit Mine | Indian Copper Complex, Hindustan Copper Ltd |

The School reports with pride its enlistment in the Directory of Industrial Consultants maintained by the *All-India Financial Institutions*, (i. e, IDBI, IFCI and ICICI). The enlistment is in respect of testing facilities, selection of well-sites by geophysical methods and hydro-geological studies, estimation of ore reserves, development and scrutiny of mine system design, geomechanical studies, mine environmental studies, appraisal of feasibility/project reports, and processes for coal and mineral beneficiation. The recognition puts this premier institute of mineral sciences and technology amongst the leading industrial consultants of the country.

8.3 It is also a pleasure to report that the Rock Mechanics Laboratory of the School was approved by the *Directorate-General of Mines Safety* for testing of mine supports. The School is currently providing testing services in the following areas :



- (1) Physico-mechanical property testing of rocks and coal.
- (2) Testing of mine supports like friction/hydraulic props & chocks.
- (3) Analysis of mines gases and coal/stone dust.
- (4) Proximate analysis of coal.
- (5) Petrological and geochemical analysis of rocks.
- (6) Calibration of load cells.

8.4 Sponsored Research :

In addition to providing these services, the School welcomes (in fact seeks) sponsored research projects from the industry. Currently, research work is progressing on the following sponsored projects :

Project	Sponsored by
1. Three Research Projects on Slope Stability/Drilling & Blasting/Stowing (for M Tech students)	Central Mine Planning and Design Institute Ltd.
2. Desulphurisation of high sulphur Assam coals by bacterial means	Central Mine Planning and Design Institute Ltd.
3. Development of a Computer model for sand stowing	Bharat Coking Coal Ltd.
4. Beneficiation studies on low-grade Manganese Ores	Manganese Ore (India) Ltd. (Funded through a Research Endowment of Rs. 1.50 Lakhs)

8.5 Grant-in-aid for Research :

In addition, ISM has been fortunate in tapping substantial research support from various other Governmental agencies, as enumerated below:

Electronics Commission :

1. Design of a defectoscope for mine ropes
2. Development of a multifrequency electro-magnetic prospecting equipment.

Department of Coal, Ministry of Energy:

3. Investigation into the problems of rock bursts.
4. Heat flow studies in deep mines
5. Evaluation of workability of Indian coal seams.
6. Control of ground movement around extraction parametess

7. Assessment of surface movement due to mineral Extraction
8. Stability of slopes in open-pit mines
9. Methane emission and drainage.

Negotiations for similar grant-in-aid are going on with the Oil and Natural Gas Commission.

8.6 Other Industrial Support

In addition, the following support is being currently received by ISM from the Industry :

- (i) Full financial support from *BCCL* for the one-year sandwich-pattern post-graduate programme in Coal Mining Machinery (being run since 1973).
- (ii) Full financial support from *ONGC* for a one-year post-graduate programme in Petroleum Reservoir Engg.

M/s Tata Iron and Steel Co. Ltd. have instituted a *Tata Steel Chair in Opencast Mining* at the School for a 3-year period, and the National Mineral Development Corporation an *NMDC Chair in Management* for a similar period. *The Oil and Natural Gas Commission* are locating, by rotation, a senior engineer as ISM to promote academic interaction. A similar arrangement has been made by the *Bharat Coking Coal Ltd.*

M/s *Manganese Ore (India) Ltd* have created a Rs. 1.5 lakh Endowment Fund at ISM for carrying out researches in the problems of manganese industry. They have donated another sum of Rs. 50,000 for the grant of annual Research Awards to young teachers and Design Awards to students.

Student Scholarships are being awarded at ISM by M/s Coal India Ltd, M/s Hindustan Copper Ltd., and NMDC.

9. GOLDEN JUBILEE ACTIVITIES

9.1 Completing half-a-century of eventful existence is a big landmark in the history of any institution; ISM achieved this rare distinction during this year. During this span of 50 years, ISM has had many 'ups' and 'downs' but if it could get out of the 'dumps', it was sheerly due to its own grim determination and will to survive.

The impetus given to the Indian Petroleum and Coal Industry in particular, and the Mineral Industry in general as a result of the Oil Crisis,

has brought a new bouyancy to the School : this is both an opportunity and a challenge. It is highly satisfying to report that the School is celebrating its Golden Jubilee in such a bright situation.

Right at the beginning, it was decided to celebrate the Golden Jubilee in a befitting manner, over a long period of time and involving all sections of ISM community. For this purpose, a high-powered Golden Jubilee Committee with the ISM Chairman as its Chairman was constituted well over a year before the D-day. The year-long programmes were carefully chalked out by this Committee, and meticulously followed. The following paragraphs present a brief review of these activities.

9.2 Inauguration :

Prof Satish Chandra, Chairman of the University Grants Commission inaugurated Golden Jubilee Celebrations on Aug 26, 1976 by releasing the first Golden Jubilee publication of the School - a book entitled "Mineralogy, Petrology and Economic Geology Tables" authored jointly by Prof N L Sharma, Hon Professor and Shri Y K Agrawal, Asstt Professor both of the ISM Department of Applied Geology. The book had been published with grant-in-aid from the National Book Trust of India.

9.3 Director's Talk on All India Radio :

On the occasion of the Golden Jubilee of the School, Prof G S Marwaha, Director, gave a talk on the All-India Radio, Delhi 'B' on Dec 3, 1976, on the National Programme which was relayed on all AIR stations. A week later, the talk was repeated on the local AIR network of Bihar.

9.4 Seminars :

The first Golden Jubilee National Seminar on "Instrumentation & Automation in Mining Industry" was held on Nov 8-9, 1976. It was inaugurated by Shri H C Sarin ICS, an administrator of national repute, then heading the Sudamdih Colliery disaster Court of Enquiry.

The Second National Seminar, of "Precambrian Stratigraphy, Tectonics and allied Mineral deposits in India" was inaugurated by Prof C S Pitchamuttu President of the Geological Society of India, on Nov 12 1976. The Seminar attracted as many as 77 papers. The valedictory address was delivered by S K Mukherjee, Additional Secretary to the Government of India in the Ministry of Mines & Steel/Department of Mines. This Seminar was also dedicated in the honour of Prof N L Sharma, Honorary Professor in the Deptt of

Applied Geology, who had achieved the rare distinction of having taught at the School since practically its inauguration 50 years ago.

Shri N B Prasad, Chairman/ONGC, inaugurated the Third Golden Jubilee National Seminar, on "Advanced Oil Recovery Techniques" held on Nov 27-28, 1976. The Seminar attracted more than 70 delegates from ONGC, OIL and AOC, in addition to several teaching and research organizations.

Dr Jagannath Mishra, the then Chief Minister of Bihar, inaugurated the Fourth National Seminar, on "Mineral Development in Eastern India", which was organised by the new department of Industrial Engg & Management, during Dec 5-6, 1976. The Valedictory address of this Seminar was delivered by Shri S L Chakravorty, Mining Adviser to the Govt of West Bengal and Managing Director, West Bengal Mineral, Development & Trading Corporation.

9.5 Golden Jubilee Course

The Deptt of Applied Geophysics, with additional support from UGC, organised a 2-week short course on "Solid Earth Geophysics", in Jan 1977. The course was inaugurated by Dr Hari Narain, Director of the National Geophysical Research Institute, Hyderabad.

9.6 International Symposium :

The Deptt of Mining Engg the largest department of the School, organised an International Symposium on "Thick Seam Mining", on Mar 4-6, 1977. It was inaugurated by Shri K S R Chari, Secretary to the Govt of India in the Dept of Coal/Ministry of Energy. In this Symposium, 25 papers, including six by foreign authors belonging to U K., U S A., France, Yugoslavia, and Poland were presented. In all, 250 delegates including some from Poland and England, participated.

9.7 Teacher Association Seminar on Quality Teaching

The ISM Teacher's Association organised a one-day Seminar on "Quality teaching in a University with special reference to ISM" on Apr 25. The Seminar was inaugurated by Prof R Prasad, Acting Director of the Bihar Institute of Technology, Sindri.

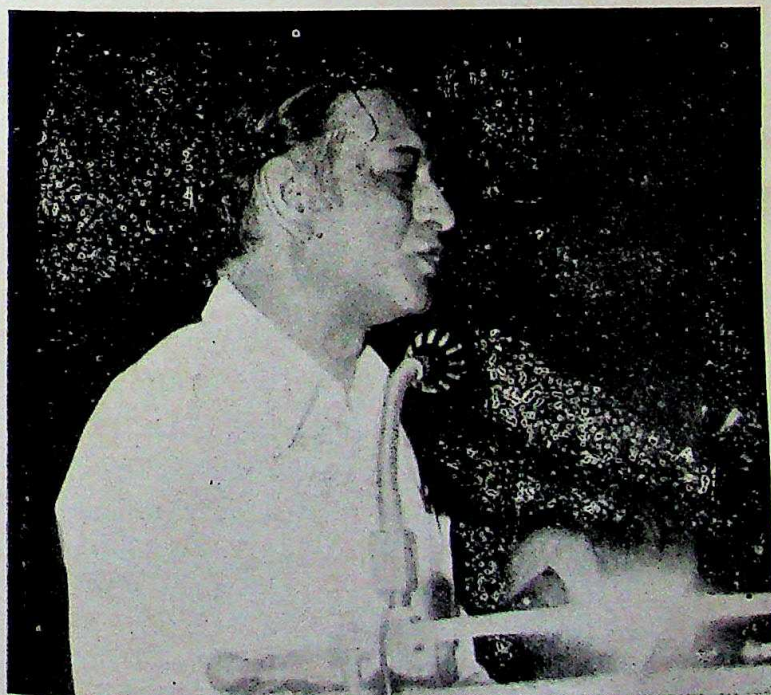
9.8 Book Fair and Exhibition

A Book Fair and Exhibition of Mining Equipment was successfully organised along with the Interdisciplinary Seminar. This activity was also inaugurated by Dr J N Mishra, the then Chief Minister of Bihar.

INSTRUMENTATION & AUTOMATION SEMINAR



Prof Marwaha and Shri Sarin discussing a point during inauguration of the Seminar.



Prof Satish Chandra, Chairman, University Grants Commission inaugurating Golden Jubilee Celebrations.

9.9 Golden Jubilee Lectures

As a part of the Golden Jubilee celebrations, several distinguished citizens are being invited to deliver open lectures at the School. The first lecture under this distinguished lecture series was delivered by Dr B D Nagchaudhury, Vice-Chancellor of the Jawaharlal Nehru University/New Delhi on Apr 30, 1977. He spoke on "Mining and Environmental Management".

In addition, all departments invited experts in various disciplines to deliver Special Golden Jubilee lectures on various topical themes connected with mineral sciences and technology. Details of these lectures are given in the departmental reports given under Part II.

9.10 Golden Jubilee Publications

G J Departmental Brochures for the following Departments have been brought out :

- Mining Engineering
- Petroleum Engineering
- Applied Geology
- Applied Geophysics
- Engineering & Mining Machinery

The Brochures for the following departments are under print :

- Chemistry, Fuel & Metallurgy
- Physics & Mathematics
- Industrial Engineering and Management

Technical Monographs for the departments of Petroleum Engg and Applied Geophysics have already been published; and those for other departments are under print.

9.11 Cultural programmes

The first Golden Jubilee cultural programme was organised by the Class III & IV employees of ISM on Nov 12/13, 1976.

Under the auspices of Cultural Scientific and Literary Society, ISM drama competitions were held on Nov 17-19, 1976 in which 14 plays, including two in English, were presented.

The ISM (Ladies) Deepti Club presented a variety programme on the evening of Nov 27, 1976.

Shri V. Chandrasekhar and party of Banaras Hindu University gave a Classical Dance programme of Bharata Natyam on Dec 5, 1976.

The ISM Students Society organised a musical contest on Feb 10, 1977. During the International Symposium on Thick Seam Mining, the Calcutta Youth Choir presented a cultural programme of folk songs and dances from all over India on Mar 4, 1977. The programme was a highly impressive one and took the audience, which included Indian and foreign delegates attending the International Symposium, on a cultural "Bharat Darshan" tour.

The Sanskriti-O-Sangram presented its Golden Jubilee Cultural Programme on the Mar 12, 1977.

9.12 Sports and Games

The ISM Sports Club organised the Bihar Body-Building and the Bihar Shri competition, on Nov 28, 1976. The North Zone and the all-India Finals of the Inter-University Tennis, Tournament, were also organised at the school. The Tournament, which was inaugurated by Prof G S Marwaha, Director of the School came to a grand finale on Jan 18 when Shri R N Sharma, Vice-Chairman & Managing Director/BCCL, and a distinguished alumnus of the School, distributed the prizes.

The ISM Student Society organised a Physical Demonstration on Mar 4, 1977.

9.13 ISM Tie and Golden Jubilee Vest

An ISM Tie has been brought out by the ISM Alumni Association. The tie is available in two colours, Navy Blue and Cocoa Brown, and carries the ISM Crest in white.

The ISM Students Society has brought out a Golden Jubilee Vest as a part of its Golden Jubilee activities. The Vest is white with the School Monogram and the word 'Golden Jubilee' screen-printed in front.

9.14 Further activities

In addition to the above, the Golden Jubilee Committee proposes to organise the following activities as a part of the final Golden Jubilee celebrations, coinciding with the G J Convocation, where the first Honorary Doctorates of the School will be confirmed :

- (1) Conferment of Distinguished Alumni Awards, Distinguished Service Awards and Long Service Awards.
- (2) Conferment of R & D Awards to young teachers. G J Design Awards to students are also being instituted

- (3) G J Supplements in newspapers and journals.
- (4) Publication of a Golden Jubilee Commemorative Volume. A Golden Jubilee Brochure has already been printed.
- (5) TV coverage of the School by the Calcutta 'Door Darshan'.

Other programmes laid out include organisation of all-India Debate and all-India Photo Competition, by the ISM students, the preparation of a History of ISM and a Colour Movie on the School, construction of a Golden Jubilee Lecture theatre (as part of the new Humanities Block) and the establishment of an Instrument Design and Development Centre.

10 ORGANISATION DEVELOPMENT

10.1 Training in educational and research management

As is clear from the earlier sections, the Indian School of Mines is in the midst of a situation of fast development and diversification, and such a situation creates considerable problems of Organisation Development. In an effort to help faculty members to accept change, if not act as 'change agents' themselves, a workshop on 'Grading and Internal Assessment' was organised by Prof V Natarajan, of the Association of Indian Universities, in Nov 1976 - in which a large number of ISM teachers participated. This was a follow-up on the following earlier seminars, etc ;

- (a) A seminar on 'Management of Education' organised at ISM, in Sept 1973, by faculty members from Technical Teachers Training Institute/Calcutta;
- (b) A seminar on 'Development of Educational Objectives' organised at ISM, in Nov-Dec 1974, by TTTI/Calcutta;
- (c) A Workshop on 'Objective Type Tests' organised at ISM, in Feb 1975, by Dr V S Mishra, then with the University of Allahabad.

Similarly, to enable ISM teachers to optimise research effort, which has grown apace at the School, a team from Administrative Staff College had organised at ISM in Dec 1974, a 4-day Seminar on 'Management of Research in the Educational Environment' which was attended by all HOD's, and other teachers already involved in research work, etc. This was followed this year, when considerable sponsored

R & D Projects have been received, by a 3-day 'Workshop on Research Management and Monitoring', organised by an ASCI team at ISM on Jan'y 14-16, 1977.

Senior ISM teachers are also regularly exposed to modern management concepts through intensive courses/seminars organised by NITIE/Bombay, Tata Management Training Centre/Poone, IIPA/New Delhi, and ISTD, etc.

10.2 External interaction :

ISM also firmly believes that its faculty members should constantly interact with their peers elsewhere in the country to improve the quality of expertise, teaching and research. It therefore liberally nominates faculty members for attending Seminars, QIP and short courses, and conferences, etc, organised by other reputed institutes. Details of this activity are given in Part II of this Report.

10.3 Advanced training :

During the year, the following teachers completed their long-term QIP training or special/study leave :

- | | |
|--|---|
| 1 Shri S P Ahuja
Asst Professor
Deptt of Mining Engg | At IIT/Kharagpur
for M Tech (Mining and Mine
Mechanisation) under QIP |
| 2 Shri K K Ray
Lecturer
Deptt of Engg and Mining
Machinery | At IIT/Kanpur for M Tech
(Elec Engg) under QIP |
| 3 Shri P K Ramasubban
Lecturer
Deptt of Engg and
Mining Machinery | At Roorkee University for
M tech (Elec Engg) under QIP |

Shri A R Ansari, Lecturer in the Deptt of Mining Engg, who had earlier obtained the M E degree from Roorkee University in Advanced Surveying, has completed his research work for the PhD degree of the same university where he worked on Geo-data Determination of Structural and Ground Deformation.

Several other ISM teachers have obtained postgraduate degree under QIP as below :

(29)

- | | | |
|---|--|---|
| 1 | Shri C R S Rao
Asst Professor
Deptt of Engineering &
Mining Machinery | M Tech degree in Material
Handling from IIT/Madras |
| 2 | Dr B P Pandey
Asst Professor
Deptt of Petroleum Engg | M Tech (Chemical Engineering)
and PhD degrees from
IIT/Kanpur |
| 3 | Dr Dipak Guha
Lecturer
Deptt of Chemistry,
Fuel & Metallurgy | PhD degree from IIT/Bombay |
| 4 | Shri V K Srivastava
Lecturer
Deptt of Mining Engg | M E in Advanced Surveying from
Roorkee University |
| 5 | Shri S Rangachari
Lecturer
Deptt of Physics &
Mathematics | M Sc Tech in Electronics
Instrumentation from
Indian Institute of Science/
Bangalore |

10.4 Technical Forum :

The long-felt need for a proper platform for intellectual interaction of faculty members was met with the inauguration on Sept 2, 1976 by Prof G S Marwaha/Director, of the ISM Technical Forum. As mentioned above, a large number of faculty members is currently sponsored for various short courses, symposia and seminars, and this Forum is intended to provide a vehicle for plough-back of experience from these courses. The Forum normally meets on the first/third Thursday of every month immediately after school hours. The following presentations were made in the Forum during the year :

- | | | | |
|---|---|-----------------|---|
| 1 | Management of Research
and Development | Sept 2
1976 | Prof S K Bordia, who had
attended a course on this
topic at the Tata Manage-
ment Training Centre,
Poona. |
| 2 | Principles of Personnel
Management | Sept 16
1976 | Prof R D Singh who had
attended a course on
'Personnel for Non-Personnel
Executives' at NITIE,
Bombay.: |

(30)

- | | | | | |
|---|---|----------|----|--|
| 3 | Management by Objectives | Nov 1976 | 4 | Prof R K Verma who had attended a course on this subject at NITIE/Bombay |
| 4 | Futurology - its application in assessing Energy Demand | Jan 1977 | 5 | Prof S P Banerjee who had attended a conference on 'Futurology' organised by the Administrative staff College of India |
| 5 | Mining Education in Australia | Jan 1978 | 8 | Shri V S Vutukuri of the University of South Wales/ Australia |
| 6 | Glimpses into Kudremukh | Feb 1978 | 3 | Prof R T Deshmukh, Director of Practical Training in Mining |
| 7 | Photo-Geology and Remote sensing Techniques | Feb 1978 | 17 | Prof S N Sarkar who had recently made a study of these techniques at Dehradun. |

10.5 Academic feedback from students

10.5.1 As a means of getting student feedback on the quality of teaching, a 'Students Reaction Survey' form was developed in 1976, to be filled in (without signing) by students of V and IV year classes at the end of their annual examinations. As the subject is a somewhat sensitive one, the 1976 study was supplemented by a similar exercise carried out in Apr-May 1977. It is intended to use the feed-back received from these surveys in indentifying shortcomings in the academic sphere and taking remedial action.

10.5.2 A similar feedback from recent graduates is planned.

10.6 Prof G S MARWAHA

During the year under review, Prof G S Marwaha, Director, was appointed —

- Member of the UGC Committee appointed to identify areas/ disciplines in which collaboration between India and Romania could be initiated to the mutual advantage of both countries, under the Indo-Romanian Cultural Exchange programme 1976-78.
- Member of the Indian side of the Jt Working Group of academicians set up by the UGC under the Indo-Polish Cultural Exchange

Programme 1977-78, to identify specific areas and institutions of higher learning for collaboration.

- An Expert Member on the reconstituted (composite) AICTE All-India Board of Undergraduate Studies.
- Member of the UGC Visiting Committee set up to scrutinise the development proposals of the BHU Deptt of Mining Engg.
- The Visitor's Nominee on the Court of the Banaras Hindu University.
- Member of the Electronics Commission 'Panel on Mining Electronics and Telecommunication', and Chairman of its 'Working Group on Manpower and Training'.
- Director on the Board of the Mineral Exploration Corporation Limited, a Govt of India Undertaking.

Prof Marwaha was also elected during the year (i) as Chairman of the Dhanbad Branch of the Mining Geological and Metallurgical Institute of India, (ii) to the Council of Institution of Engineers (India) for a second term of four years, and also (iii) Chairman of the Mining and Metallurgy Division of the Institution for a two-year term. He continued this year also as Chairman of the CMRS Expert Committee, set up under the CSIR's 5-year appraisal scheme, for the promotion of its senior scientists. He was also invited by the UPSC to serve as an expert on several of its Interview Boards. He continued some other association as below.

- * Expert Committee, CMRS Mine Technology Group, as Member
- * Eastern Regional Committee of All India Council of Technical Education, as Member
- * Bihar State Committee for Science and Technology, as Member
- * Govt of India Joint Committee of Development of Small Scale Industries in Bihar, as Member
- * Task Force on Heavy Industry, Bihar State Planning Board, as Member
- * Mining Education Advisory Board, Govt of West Bengal, as Member
- * Board of Mining Examinations set up under the Metalliferous Mines Regulation, as Member
- * Govt of India Joint Board on Mining Engineering Education and Training, as Member
- * Institution of Mining Engineers, London, as Council Member for India

- * Institution of Mining and Metallurgy, London. as Council Member for India, Pakistan and Bangladesh.
- * Indian Society for Training and Development, as Member
- * Indian Society for Technical Education, as Member
- * Dhanbad Productivity Council, as Member.

10.7 National Lecturer and Associate

Dr M Prakash, Lecturer in the Deptt of App Geology, was selected as a National Associate for 1976-81 under a UGC Scheme under which selected teachers are given the opportunity to carry out research work on a subject of their choice in other academic/research institutes. Dr S K Bordia had been selected as National Associate earlier. under the same scheme, for 1975-80.

Incidentally, under a parallel UGC scheme under which senior teachers are selected for delivering lectures at other institutes of higher learning, on invitation, Prof R K Verma had been selected National Lecturer for 1973-74.

11. STAFF

11.1 On 30. 6. 1977, Prof S N Mitra, Professor and Head of the Department of Physics and Mathematics, retired from the services of the School, after a long service of nearly 30 years. Born in 1. 2. 1917, Prof Mitra had joined the School on 1. 12. 1947 as Lecturer. He was appointed Asstt Professor on 17. 8. 1961, and Professor-Head on 1. 4. 1967. In 1957-58, he was deputed to France for carrying out research work at the University of Strasbourg/France under a French Govt Research Fellowship. Gentle, soft-spoken and over helpful, Prof Mitra was loved and respected by all and more particularly by the students. He was a fair and firm administrator and a highly competent teacher. It was under his inspiring leadership that the Department developed competence in the area of electronics. During the later part of his stay at ISM, he played a significant role in developing the research activities of his Department. Just before retirement, he had carried out considerable work on designing M Phil courses in Physics and Mathematics.

11.2 Shri B K Tikadar, Asstt Registrar (Students affairs), retired from the Services of the School on 31. 1. 1977. Born in 1. 2. 1917, Shri Tikadar had joined ISM on 4. 2. 1960, as Demonstrator. He was promoted Instructor on 1. 7. 1964 and Asstt Registrar on 19. 6. 1973.

11.3 The other changes that took place amongst the academic staff during the year listed below :

A. Appointments, etc.

1. Shri S K Gupta, joined as Professor of Mining Machinery in the Deptt of Engg and Min Machinery on 15. 9. 1976.
2. Shri S V B Subba Rao, Lecturer, promoted as Asstt Professor, in Mineral Engg on 11. 10. 1976.
3. Dr K L Rai, Lecturer, promoted as Asstt Professor, Deptt. of App Geology on 23. 10. 1976.
4. Shri M S Cheema, joined as Lecturer in the Deptt of Industrial Engg & Management on 8. 11. 1976.
5. Dr K R Nag, Asstt Professor in Math promoted as Professor in Math, on 18. 11. 1976.
6. Shri Gupteswar Prasad, Lab Technician in the Deptt of App Geophysics promoted as Lecturer, on 9. 12. 1976.
7. Dr Manoj Mukhopadhyay, joined as Lecturer, in the Deptt of App Geophysics, 23. 12. 1976.
8. Dr S N Rai, Lecturer promoted as Asstt Professor in the Deptt of App Geology on 10. 1. 77.
9. Dr A K Misra, joined as Visiting Professor in Mining on 1. 2. 1977.
10. Dr L N Upadhyay, joined as Lecturer in Statistics, Deptt of Physics & Math. on 1. 3. 1977.
11. Dr P Singh, joined as Asstt Professor of Personnel Management, Deptt of Industrial Engg & Management, on 15. 3. 1977 (AN)
12. Dr T C Rao, joined as Professor of Mineral Benefication, in the Deptt of Chemistry, Fuel & Metallurgy, on 17. 3. 1977.
13. Shri D P Paul, joined as Lecturer in the Deptt of Pet Engg on 2. 4. 1977.
14. Dr B B Bhattacharya, joined as Professor in App Geophysics, on 7. 5. 1977.
15. Dr S B Basu Mallick, joined as Asstt Professor in the Deptt of App Geology, on 7. 5. 1977.
16. Shri B K Kejriwal, joined as Asstt Professor in the Deptt Min Engg on 11. 5. 1977.
17. Shri M S Chhabra, joined as Asstt Professor in the Deptt of Min Engg on 18. 5. 1977.

18. Shri H Lahiri, Workshop Superintendent was transferred to the Post of Asstt Professor, Deptt of Engg & M M on 20. 6. 1977. on handing such change to shri A Chottopadhyay, Asstt Professor in the same Deptt.

B. Reversion

Shri C R C Rao, Professor in the Deptt of Engg & M M, reverted to his substantive post of Asstt Professor, with effect from 21. 6. 1977.

C. Resignation and Lien, etc.

1. Dr S K Baijal, Asstt Professor, Deptt of Pet Engg, was relieved on lien with effect from 3. 12. 1976, to join as Senior Lecturer, University of Bening Nigeria.

2. Dr R T Shukla, Asstt Professor, Deptt of App Geology was released on lien with effect from 11. 12. 1976 to join as Director, Directorate of Mines and Geology, Govt Gujrat.

3. Dr R S Konar, Professor & HOD, Chemistry, Fuels, & Metallurgy resigned with effect from 31. 3. 1977 (AN).

4. Dr M Poddar, Asstt Professor, Deptt of App Geophysics was released on lien from 1. 6. 1977 to join the National Geophysical Research Institute, Hyderabad, as Asstt Director.

5. Shri S K Gupta, Professor in Min Machinery. resigned with effect from 15. 6. 1977.

6. Shri D P Paul, Lecturer, Deptt of Pet Engg, resigned with effect from 25. 6. 1977.

D. Deputation, Extraordinary leave, Study leave, etc.

Name and Designation

Training and period

- | | |
|---|--|
| 1. Shri V K Srivastava,
Lecturer, Deptt of
App Geophysics. | Higher study at University of
St Louis, USA on Extraordinary
Leave, for a period of 12 months
form 23. 8. 1976. |
| 2. Dr B N P Agarwal
Lecturer. Deptt of
App Geophysics | Higher study at Netherland, on
Extraordinary leave, for a period
of 11 months from 27. 9. 1977. |
| 11.4 The following changes took place in the administrative/non-teaching staff at the School during the year. | |

Officers

Appointment :

1. Shri C S Mogra, appointed as Development Officer, with effect from 6.12.1976.

(35)

2. Shri D N Bhattacharjee, appointed as Deputy Registrar (Administration), with effect from 7.1.1977.
3. Shri Ambar Sarkar, appointed as Accounts Officer, with effect from 1.4.1977.
4. Shri Michael David, appointed as Asstt Librarian, with effect from 1.6.1977.

Resignation/Lien

Shri M S Ramamurthy, Registrar, was released on 30.4.1977 to go back to his parent organisation, the Association of Indian Universities. The period of 29 months that he was at I S M were crucial for its development and Shri Ramamurthy contributed considerably to this phase.

Class III Staff

Appointments/Promotions

1. Shri Goutam Das, appointed as TA (Photography) with effect from 2.8.1976.
2. Shri S D Das, appointed as Mechanic with effect from 13.8.1976.
3. Shri Saryoo Sinha, appointed as Professional Asstt with effect from 18.8.1976.
4. Shri S B Ghosal, appointed as Professional Asstt with effect from 9.9.1976.
5. Shri A C Bhattacharya, appointed as Semi-Professional Asstt with effect from 10.9.1976.
6. Shri A Chattopadhyay, appointed as TA with effect from 13.9.1976.
7. Shri Rakesh Kumar, appointed as TA with effect from 15.9.1976.
8. Shri S P Mahato, appointed as Semi Professional Asstt. with effect from 27.9.1976.
9. Shri K C Sharma, appointed as TA with effect from 7.10.1976.
10. Shri P V Unikrishnan, appointed as SA with effect from 6.10.1976.
11. Shri N H Shastri, appointed as SA (Museum) with effect from 6.10.1976.
12. Shri B Sengupta, appointed as SSA with effect from 8.11.1976.
13. Shri Rajendra Kumar, appointed as SA with effect from 4.12.1976.
14. Shri Ajay Kumar Roy, appointed as L D C with effect from 19.1.1977.

15. Shri S N Das, appointed as L D C with effect from 1.2.1977.
16. Shri M M Konar, appointed as SA with effect from 12. 2. 1977.
17. Shri Dipankar Ghosh, appointed as STA with effect from 18. 3, 1977.
18. Shri Mongal Mondal, appointed as L D C with effect from 21. 3. 1977.
19. Shri B Yadav, appointed as L D C with effect from 21. 3. 1977.
20. Shri D Sarkar, appointed as LDC with effect from 25. 3. 1977.
21. Shri S N Dubey, appointed as TA with effect from 28. 3. 1977.
22. Shri S S Hati, appointed as L D C with effect from 30, 3. 1977.
23. Shri C K Banerjee, appointed as L D C with effect from 1. 4. 1977.
24. Shri A K Srivastava, appointed as Draftsman with effect from 12. 4. 1977.
25. Shri B Paswan, appointed as Driver with effect from 25. 4. 1977.
26. Shri R N Pathak, L D C promoted U D C with effect from 2. 5. 1977.
27. Shri O K Tirkey. L D C, promoted U D C with effect from 2. 5. 1977.
28. Shri B Prasad, L D C, promoted U D C with effect from 2. 5. 1977.
29. Shri Md Hanif, L D C, promoted U D C with effect from 2. 5. 1977.
30. Shri B N Ghose, L D C, promoted U D C with effect from 2. 5. 1977.
31. Shri K D Sharma, L D C, promoted U D C with effect from 2. 5. 1977.
32. Shri M P Verma appointed as SA with effect from 5. 5. 1977.
33. Shri K M Sarkar, U D C promoted Assistant with effect from 9. 5. 1977.
34. Shri P K Hazra, appointed as STA with effect from 23. 5. 1977.
35. Shri Bhagwan Das Shaw appointed as Driver with effect from 31. 5. 1977.
36. Shri S Y Kulkarni, P T to Director, promoted as Office Supdt with effect from 1. 6. 1977.
37. Shri N B Sarkar, Sr Stenographer appointed as P T to Director with effect from 1. 6. 1977.

(37)

38. Shri S K Bose, Stenographer, promoted Sr Stenographer with effect from 1. 6. 1977.

39. Shri S R Kundu, Draftsman, promoted TA (Draftsman) with effect from 13. 6. 1977.

40. Shri Saryoo Sinha, Professional Asstt. promoted Senior Professional Assistant with effect from 22. 6. 1977.

41. Shri V D Rao, STA, promoted Foreman Instructor (Mechanical) with effect from 24. 6. 1977.

Retirement/Superannuation

Shri T K Sarkar, Office Supdt, retired on superannuation with effect from 31. 5. 1977.

Resignation/Lien, etc.

1. Shri S B Ghosal, Professional Asstt, resigned with effect from 16. 3. 1977.

2. Shri P V Unnikrishnan, SA, resigned with effect from 21. 5. 1977.

3. Shri S K Roy, Library Asstt, relieved on lien to join IIT/Kanpur as Asstt Librarian with effect from 21. 5. 1977.

Class IV staff

1. Smt Gope appointed as Mazdoor with effect from 5. 7. 1976.

2. Shri R A Ram Lab Attendant, promoted Ferro Printer with effect from 14. 3. 1977.

3. Shri Muneshwar Pd, appointed as Lib Attendant with effect from 11. 4. 1977.

4. Shri Niranjana Kumar Sinha, appointed as Lib Attendant with effect from 11. 4. 1977.

5. Shri Chotulal Manjhi, appointed as Lib Attendant with effect from 12. 4. 1977.

6. Shri Birendar Kishore Sinha, appointed as Lib Attendant with effect from 18. 4. 1977.

7. Shri Dukhu Mondal, Mali, promoted Head Mali with effect from 2. 5. 1977.

8. Shri A Ghosal, Cook-cum-bearer, appointed with effect from 2. 5. 1977.

9. Shri Ramdhani Dome, Sweeper, promoted Jamadar with effect from 2. 5. 1977.

10. Shri Inderdeo Rajak, Mazdoor
11. Shri Bharat Rai, Orderly
12. Shri P Dubey, Daftry
13. Shri Gandhi Paul, Bearer
14. Shri A B Mishra Peon
15. Shri J K Dubey. Orderly
16. Md Khalil, Peon

promoted as Lab Attendant
with effect from 2. 5. 1977.

18. Shri Shankar Dutta
19. Shri Kallo Ram Mahato
20. Shri Santosh Rakshit

appointed as Mazdoor with
effect from 11. 6. 1977.

21. Shri Parasuram Mistry
22. Shri S N Ray
23. Shri Panchu Kumar

appointed as Mechanic 'C'
with effect from 13. 6. 1977.

24. Shri Durga Pd Mondal
25. Shri Santosh Kr Modi
26. Shri Bharat Chandra Gope
27. Shri Duryodhan Mondal
28. Shri M M Upadhyay
29. Shri Murulidhar Mondal
30. Shri Pawan Mondal
31. Shri Ramdulal Kumbhkar
32. Shri Ganga Pd Das
33. Shri Falguni Rawat
34. Shri Sudhir Gope
35. Shri Atul Kumar

appointed as Messenger with
effect from 13. 6. 1977.

36. Shri Ratan Singh Bahadur
37. Shri Sudhir Mondal
38. Shri Ramjee Prasad Singh
39. Shri Lal Mohan Gope
40. Shri Dugroo Pd Mahato
41. Shri Santu Gope
42. Shri Haricharan Mahato
43. Shri Rajendra Pd Gope
44. Shri Chandi Pd Mahato
45. Shri Nand Bahadur Pune
46. Shri Sankar Mahato

appointed as Chowkidar with
effect from 13. 6. 1977.

- | | | |
|-----|---|---|
| 47. | Shri Deodip Singh | |
| 48. | Shri Sahadar Roy | |
| 49. | Shri Chhota Mahato | |
| 50. | Shri Abdul Aziz | appointed as Chowkidar with
effect from 13. 6. 1977. |
| 51. | Shri Iswar Lal Manjhi | |
| 52. | Shri Madho Mandal | |
| 53. | Shri Dhiren Mallick | |
| 54. | Shri Baijanath Mallick | |
| 55. | Shri Panchanan Haldar | |
| 56. | Shri Sheo Prasad Rajak | appointed as Mazdoor with
effect from 13. 6. 1977. |
| 57. | Shri Gokul Mondal | |
| 58. | Shri Ambujakshaya Banerjee | |
| 59. | Shri Sardar Singh, Chowkidar Promoted Head Chowkidar with
effect from 20. 6. 1977. | |

Superannuation/Retirement

Shri Bhukal Mahato, Garden Mazdoor, retired on superannuation with effect from 28. 2. 1977 (AN)

Resignation

Shri Sonaram Hembron, Peon, resigned with effect from 25. 2. 1977.

Death

Shri S C Ram, Lab Attendent, died on 7. 12. 1976.

11.5 The Establishment schedule of the School as on 30. 6. 1977, is given in Annexure I (A).

12 STUDENT AND CO-OURRICULAR ACTIVITIES

12.1 Shri S K Agarwal, V year (Mining) was selected for the award of the first "Best Student Shield" recently instituted by the School. He scored the highest in a score covering academic performance, physical efficiency, co-curricular activities, outdoor games and conduct.

12.2 To properly motivate the students in activity participating in field activities, the Academic council had at a meeting held in 1975-76, decided to enhance the Sessional marks in the NSS/NCC/NSO (Sports) group to 150. This has had the desired effect and students are participating in these above activities with much greater enthusiasm and interest.

12.3 The following were the office-bearers of the various ISM societies that functioned during the year 1976-77 :

	Society	President	Secretary
1.	ISM Students Society	D K Ghosh	H K Sharma
2.1	Cultural Scientific and Literary Society	S N Mitra	R Seth
2.2.2	Chayanika Sangh	B L Jha	B K Saxena
2.3	Sanskriti-O Sangram	S K Das	A Sarkar
3.	Photographic Society	P K Gangopadhyay	D K Ghosh
4.1	Mining Engg Society	R D Singh	S K Das
4.2	Petroleum Engg Society	S Srinivasan	N K Bharali
4.3	Geological Society	S N Sarkar	John Mathai
4.4	Geophysics Society	R K Verma	A Chatterjee

12.4 ISM Student Society

12.4.1 A list of the ISS Executive, as elected under the ISS Constitution, is appended at Annexure V.

12.4.2 The ISS took up with the administration several student grievances, including the following on which administrative action was initiated during the year :

- Improvement of canteen facilities.
- Medical facilities for Research Scholars.
- Resumption of weekly bus service to Jharia.
- Auditorium renamed as 'Penman Auditorium', in honour of the Founder-Principal of the School.

ISS also drew the attention of the authorities to the following other issues :

- Early start of a Film Club and a Music Club
- Improving of ventilation in the Library
- Keeping the Library open upto 10.00 p m on weekdays
- Need for prior consultation with concerned students in respect of the course, changes etc.
- Rethinking on making the games and sports compulsory
- Adding a balcony to the Penman Auditorium

12.4.3 After a break of several years, ISS brought out the ISM Magazine in the early part of the 1977-78 Session. In its handing-over charge

report to the new 1977-78 Executive (for which a special function was held for the first time), the outgoing Secretary expressed the hope that this Magazine would soon become fully established.

12.4.4 With a sum of Rs. 4,000/- sanctioned by the authorities for ISS participation in Golden Jubilee celebrations, ISS organised a Musical contest and also a Physical Demonstration show. ISS also brought out a Golden Jubilee Vest.

12.4.5 With the avowed objective of bringing 'ISS more near to student body and to encourage more and more participation in its various activities and policies', ISS brought out 'An ISS Questionnaire' which was distributed to all students. Though only a few students responded, the feedback, which was passed on to the administration, has been taken note of.

12.4.6 The outgoing ISS Executive also played a very constructive role in reducing the ragging of new students enrolled for the 1977-78 Session.

12.5 National Service Scheme

The NSS activity for the year started with Sports of ISM staff children on Aug 15th, 1977.

A 10-day Special Camp of 100 NSS volunteers was successfully conducted at Kola Kushuma, and this village was adopted by the ISM NSS unit for its all-round development. Advantages of family planning, the evils of dowry, care against dirt and disease, were explained to the nearly thousand-and-odd villagers residing in the village. NSS volunteers also carried out a socio-economic survey of the village. During the 10-day camp, the volunteers successfully completed the repair and construction of a road of about 4 km length leading to the village. Adult literacy, establishment of an Adarsh Library and distribution of writing aids to poor children, were other projects taken up by the volunteers. Shri Lakshman Shukla, Deputy Commissioner/Dhanbad was the Chief Guest and delivered the Valedictory address at the concluding function of the camp, which was presided by Prof G S Marwaha, Director ISM.

NSS Volunteers were also engaged during the year in hostel cleaning and campus cleaning programme. Rodent and Pest management programme was also taken up. Shri Mukhdeo, Lecturer in the Deptt of Physics and Mathematics, continued to be the Programme Coordinator.

12.6 National Cadet Corps

NCC is compulsory for the I year students, except those with exceptional ability in sports. Parades were held on every Sunday.

Besides, special parades were organised on the Independence Day and the Republic Day. To conduct the NCC programmes and train ISM cadets efficiently, one Subedar and two NCOs were deputed by the 36th Bihar Battalion/NCC. Major P S Kochhar was the Officer Commanding, and Shri S N Mahato, Instructor in the Department of Engineering and Mining Machinery, was the NCC Officer.

12.7 National Sport Organisation :

At long last, ISM was recognised during its Golden Jubilee year, as a good centre of Sports and Games. The North Zone and the All-India Finals of the Inter-varsity Tennis Tournament were conducted at ISM in Jan 2-18-1977 with much fanfare. 27 teams participated in the North Zone tournament in which Delhi University emerged as the winners and Allahabad University the runners-up. Madras University and Mysore University, emerged as winners and runners-up respectively in the All-India Finals. Shri R N Sharma, Vice Chairman and Managing Director/BCCL who is a keen tennis player himself, distributed the prizes. The tournaments, which aroused much enthusiasm were organised by Shri R Singh, Physical Training Superintendent, assisted by Shri S Tewani and Shri A K Adak, ISM coaches.

In the Bihar State Boby-Building competition, which was held (as a part of Golden Jubilee activity) at ISM on Jan 18, 1977, Shri Kalyan Mishra was selected as "Bihar Sri" in his weight.

As in the previous years, ISM students continued to evince keen interest in the various games like foot-ball, volleyball, badminton, table-tennis etc. The gymnasium also continued to be popular. ISM teams participated in many a inter-varsity meets but unfortunately without much success.

12.8 Cultural activities :

The Cultural Scientific and Literary Society, under the Presidentship of Prof S M Mitra, contributed a fitting tribute to ISM in its Golden Jubilee year, when its nominee, G Ravi Sanker, I year student, bagged a Special Prize in the Inter-University National Debate held at A P Agricultural University, Hyderabad, on Feb 8-9, 1977. The topic of the debate was : "Cooperation Movement is the Best Instruments to involve Youth in Programmes of Economic Development".

C S L S remained very active throughout this Golden Jubilee year. It organised a Drama Competition on Nov 17-19, 1976, in which no less than 14 plays, including two in English, were enacted. All

the plays were directed by the students themselves in accordance with the requirements of a modern stage. The Society also, as usual, brought out several news bulletins and organised quiz competitions and debates.

The Sanskriti-O-Sangram organised its usual programmes, to the appreciation of one and all. The Chayanika Sangh, as usual celebrated Janamasthami and other festivals with usual pomp and Pelf.

12.9 Mining Engg Society :

The Society initiated action to bring out a journal of its own. Some articles for publications have been already collected and many more are expected. It is hoped that the first Journal of the Society will be published before the Golden Jubilee Convocation.

The Society collaborated with the Deptt of Mining Engg in arranging a series of Golden Jubilee lectures. Some technical films were also screened. The Society hopefully looks forward to intensifying its activities for promoting the science and art of mining and mining education.

12.10 Petroleum Engg Society :

The Society arranged the following technical lectures .

- (1) "Some problems of development of limestone reservoirs" by Shri A N Sriramulu, Dy Director/ONGC, on 4. 9. 76.
- (2) "Indian Oil Corporation - its intake procedure and marketing operations" by Shri P N Singh of IOC/Bombay, on 21. 10. 76.
- (3) "Oil and Gas pipelines" talk by Shri S P Kapoor, Senior Technical Adviser, Oil India Ltd, New Delhi, on 24. 2. 77.
- (4) "Mathematical Simulation of water-coming and its remedial measures" Dr M M Mehta, Data Electronics Combine, New Delhi, on 10. 3. 77.

12.11 Geology Society :

Members of the Society took active part in organizing the Golden Jubilee National Seminar on "Precambrian Stratigraphy, Tectonics and Associated Mineral Deposits in India" on Nov 12-13-1976.

A farewell party was given to Dr R T Shukia on 8. 12. 76 on the eve of his departure from the School to join the post of Director, Gujrat Mineral Development Corporation, Ahmedabad.

12.12 Geophysics Society :

The Society facilitated Dr Hari Narain. Director/NGRI, when he visited the Department on Jan 17, 1977 to inaugurate the Golden Jubilee Short Course on 'Hard Rock Geophysics'.

The Society gave a fitting farewell to Prof J Singh, CSIR Emeritus Scientist (and Retired Head of ISM Dept of Applied Geophysics) on the eve of his departure home in the last week of Jan, 1977.

The Society organised a special lecture by Dr Shivaji Das Gupta, an alumnus of ISM now in U S A, on "Seismic Data Processing" in Feb, 1977.

12.13 ISM Alumni Association

During the Basant of 1974, a decision was taken by the alumni present to revive the ISM Alumni Association with a new constitution; and a committee was appointed with Prof R T Deshmukh. as convener. to frame a draft constitution. The draft constitution prepared by the committee was considered during the 1975 Basant and adopted with certain modifications. A copy is available from Prof B K Mozumdar, Hony Secretary, ISM Alumni Association, Indian School of Mines, Dhanbad - 826004.

The first office-bearers of the central Association were Shri R N Sharma (President), Shri M N Guin (Vice-President), Prof B K Mozumdar (Secretary), Shri T B Lal (Joint-Secretary) and Shri N K Patnaik (Hony Treasurer).

During the Annual General Meeting held on the occasion of the 1976 Basant, Shri R N Sharma was re-elected as President, and Prof B K Mozumdar as Hony Secretary. Shri V K S Varadan was elected Vice-President, Shri S S Salodkar as Joint-Secretary, Shri B P Jha as Hony Treasurer and Prof S P Banerjee as Hony Auditor.

Since 1975, ISM alumni in several centres have got together and five Local Chapters of the ISM Alumni Association have so far been set up. The Association has 365 Full members and 250 Associate members on its rolls.

13 STUDENT ASSISTANCE AND WELFARE**13.1 Scholarships :**

As many as 275 students were recipients of scholarships, free tuitions, loan scholarships, etc., during the year as detailed below :

(45)

Name of agency awarding the scholarship	Number of awardees	
I S M Scholarship	57	
Free tutionship	31	88
<i>State Govt. Scholarships</i>		59
Andhra Pradesh	1	
Assam (including 2 postgraduate scholarships)	10	
Bihar	35	
Delhi	1	
Maharastra	2	
P & T Dept	1	
Sikkim	1	
Tamil Nadu	1	
Uttar Pradesh	14	
West Bengal	24	
Orissa	2	
Meghalaya	1	
<i>National Scholarships :</i>		35
Assam	1	
Bihar	17	
Madhya Pradesh	1	
Orissa	5	
Punjab	1	
West Bengal	8	
Uttar Pradesh	2	
<i>Scholarship to SC/ST/OBIC :</i>		43
Assam	6	
Bihar	16	
Meghalaya	1	
Punjab	1	
West Bengal	20	
<i>National (and other) Loan Scholarships :</i>		3
Bank of India	1	
Orissa	1	
West Bengal	1	
<i>Government of India Scholarship to foreign students :</i>		14
Bangladesh	8	
Nepal	5	
Bhutan	1	

Name of agency awarding the scholarship	Number of awadees
<i>Other Scholarships :</i>	
Coal India Ltd (for students of Mining Engg) (10 scholarships per class per year @ Rs. 150/- p. m.)	19
Hindustan Copper Ltd (for students of Mining Engg (One per year, newly instituted for three senior classes. @ Rs. 250/- p m for III year, Rs. 300/- p m for IV year and Rs. 450/- p m for V year)	3
Assam State Public Works Welfare Trust	1

All V year students of Applied Geology and Applied Geophysics were granted UGC Scholarships; all non sponsored post-graduate students were also recipients of PG scholarships.

ISM is very thankful to N M Dc who have decided to award scholarships to Min Engg students two each from III to V the year B Tech.

13.2 Student Aid Fund

In addition, financial assistance from Students Aid Fund, amounting to Rs. 10,000, was granted to 20 students.

13.3 Research Fellowships

Research Fellowships as below were awarded during the year :

	Teaching	Senior Research	Junior Research	Total
CSIR (including CSIR Projects)	—	—	10	10
UGC (including UGC Projects)	3	—	5	8
ISM	—	2	18	20
GOI (For foreign students)	—	1	—	1
Others	—	—	2	2
Total	3	3	35	41

13.4 Hostels :

Besides the two main hostels, the Barracks hostel which was reopened two years ago to accommodate the increasing number of

students, continue to house the I year students. With the hostel accommodation lagging far behind the student population, the students of II and III year classes as also many of the research scholars had to double in single-seated rooms. It is heartening therefore to report that work on the construction of a new 200-seat hostel has already started.

13.5.1 Hostel Furniture :

(1) The numbering of furnitures in all hostels was completed and a complete inventory prepared.

(2) In order to accomodate the increasing number of students, 70 new cots, 50 new chairs and 75 tables were purchased.

(3) A large amount of furniture lying in broken condition in various hostels was repaired during the Summer Vacations.

(4) The Common Room in the Barracks Hostel was furnished with jute carpets, curtains as well as sofa chairs and tables. A Radio was purchased for the Common Room and a suitable case prepared for the same.

13.5.2 Hostel Sports and Indoors Games, etc.

(1) A new Badminton Court for inmates of the New Hostel was inaugurated by Shri J G Kumarmangalam, Chairman/ISM Executive Board on 26-7-1976.

(2) The I year students residing in the Barrack Hostel were active in volley-ball and badminton, and proper courts for both these games were constructed in the Barrack Hostel.

(3) Games activities in the Old Hostel continued at a brisk pace.

(4) Indoor game activities were, as usual, quite intensive during the first part of the session.

13.5.3 Rations :

New ration cards were issued for 460 students, by the District Supply Officer/Dhanbad. General and special quota of wheat and sugar was provided to the 14 different messes regularly running throughout the year. During the months of scarcity, additional supplies of vegetable oil were also arranged through the D S O.

13.5.4 General :

(1) White-washing and cleaning was done for practically all the rooms, varandahs as well as bath-rooms, etc, in all the hostels.

(2) With the Barrack Hostel having been provided with a standby-generator connection during the year, all hostels are now insured against the frequent light failure, so that all students can now study without any interruption.

(3) Water coolers and water heaters were functioning more or less normally in all the hostels.

(4) As a part of programme of the Tree Plantation within the Campus, trees were planted Barrack Hostel as well as in front of the New Hostel and the Old Hostel. The tree plantation ceremony in the Barrack Hostel was performed by Mrs G S Marwaha.

(5) The I year students arranged a Cultural Programme on 16. 4. 77 as a part of the Hostel Day Celebration. The programme was attended by Shri J G Kumarmangalam, Chairman/ISM Executive Board, and several other distinguished guests.

13.5 Canteen and Cooperative Stores :

A Canteen located in the ground floor of the Administration Building next to the Central Library, continued to cater to the needs of the ISM community. Action by the state authorities to wind up the affairs of the ISM Cooperative Stores, which were closed down under court orders in Oct '69, is nearing completion.

13.6 Dispensary :

Dr S N Sinha, who was on deputation at ISM from the Ministry of Health and Family Welfare, Govt of India, went back to his parent department near the end of the year. About 100 patients utilise the services of ISM dispensary every day.

It is good to report that the construction of a proper Health Centre building at ISM has been approved by the University Grants Commission.

13.7 Students Discipline :

The "Students Discipline and Greivance Procedure" formulated two years ago is working well and the general atmosphere at the campus was quite congenial. General discipline within the hostels was very good.

In spite of the strict measures taken to eliminate ragging completely, a few stray incidents of ragging were still reported. Due Disciplinary action was taken against the concerned students.

13.8 Standbye Generating Set and Additional Water Supply :

The stand-by (diesel) generating set (of 176 KVA capacity) installed last year, is working well and there is no more greivance from the students regarding power shedding. In the earlier years, the students used to face a lot of difficulty in this regard, especially in summer, when students are busy preparing for their annual examinations. The installed generating capacity however is not adequate to cover the needs of the residential colonies, and this continues to be a constraint on the academic activities of teaching staff.

ISM expects to commission its VII well early next year. The work is progressing well and when the well is commissioned water supply will be able to just about keep pace with the expanding population of the Campus.

14 SCHOOL AUTHORITIES COMMITTEES AND MEETINGS

14.1 General Council :

The General Council of the School met twice during the year. The sixth meeting of the Council was held on Aug 25, 1976, when the Annual Report of the School for 1965-76 was approved. The Revised Estimates for 1976-77 and Budget Estimates for 1977-78 were approved at a special meeting of the Council held on Oct 18, 1976.

A list of members of the General Council as on 30. 6. 77 is given at Annexure VI-A.

14.2 Executive Board :

The Executive Board of the School met three times during the year (on July 30, '76, Nov 26, 76 and March 22, 77) and took the following main decisions :

- 1 To include a new Bye-law relating to Dowry in the ISM bye-laws :
- 2 To accept the offer of Mrs Purnima Sinha of the Administrative Staff College of India of an amount of Rs 7000/- (to be supplemented by another Rs 3000/-, if necessary) for creating an endowment at the School for a Memorial Lecture in honour of her father, late Shri Chandra Kishore Choudhury.
- 3 To involve ONGC in a pre-admission ISM test for those opting for the Petroleum Engineering discipline.

- 4 To vest the Chairman, Director and Registrar with powers of disposing of unserviceable, surplus or obsolete stores.
- 5 To clarify the age of superannuation.
- 6 To make provision of Death-cum-Retirement Benefit scheme according to Ministry of Finance's directive.
- 7 To enhance the rate of remuneration for Entrance Examination Work.
- 8 To revise the pay-scales of Registrar, Librarian and Assistant Registrar.
- 9 To extend medical benefits to Research Scholars.
- 10 To prescribe qualification for the post of Professor and Assistant Professors.
- 11 To convert five ISM Junior Research Fellowships into Research Associateship.
- 12 To confer Honorary Doctorate Degrees at the Golden Jubilee Special Convocation.
- 13 To purchase one microscope for the Deptt of App Geology.
- 14 To introduce sabbatical rules for the teaching staff of the School.
- 15 To revise the remuneration payable to external examiners.
- 16 To constitute an age-review committee

A list of members of the Executive Board as on 30. 6. 77 is given at Annexure VI-B.

14.3 Academic Council :

The Academic Council of the School met once during the year on Oct 16, 1976. Some of the important decisions taken by the Academic Council are :

- 1 To revise the University Examination Rules
- 2 To revise the Rules for the M Phil Programme
- 3 To approve a proposal to create a National Centre for Geomechanics at ISM
- 4 To approve conferment of Honorary Doctorate Degrees at the forthcoming Golden Jubilee Convocation.

A list of members of the Academic Council as on 30. 6. 77 is given at Annexure VII-A.

14.4 Board of Research Studies

The Board of Research Studies constituted as per Annexure VI(B), met twice in the year - on Oct 23, 1976 and June 13, 1977. Some of the important decisions taken by the Board during these meetings are given below :

- (1) The BRS decided to fix the following norms in respect of number of Research Scholars to be accepted for providing guidance by individual teachers :
 - (a) Professor : Six whole-time Research Scholars
 - (b) Asstt Professor : Four whole-time Research Scholars
 - (c) Lecturers : Three whole-time Research Scholars.

The BRS also decided that, for this purpose :

- (i) Four external Research Scholars be treated as equal to on whole-time Research Scholar.
 - (ii) In case of a whole-time scholar having more than one research guide, each of the joint guides be credited with only half scholar.
- (2) The Board approved (i) Coal India Ltd (ii) Oil India Ltd and (iii) Singherani Collieries Co Ltd as additional centres for research.

During the year 1976-77, 29 part-time and 20 whole-time research registrations were approved by the BRS, which take the total number to 95 part-time & 36 whole-time registrations.

14.5 Board of Courses of Studies :

Annexure X gives lists of membership of the various Boards of Courses and Studies as on 30. 6. 77. The Boards met from time to time during the year to consider and revise the various courses of studies offered/to be offered at ISM. Details are given in Part II of the Report.

15 FINANCE AND ESTABLISHMENT

15.1 Finance and Establishment Committee

The Finance and Establishment Committee, consisting of the following members, met three times during the year :

1. Shri R N P Sinha,
Dy Financial Advisor
Ministry of Education and
Social Welfare
- Chairman

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2. Shri V R Reddy,
Director (Technical)
Ministry of Education and
Social Welfare
3. Shri S Bagchi,
Director,
Central Mining Research Station
Dhanbad
4. Shri Hari Narain,
Director,
National Geophysical Research Institute.
Hyderabad
5. Prof G S Marwaha,
Director,
Indian School of Mines

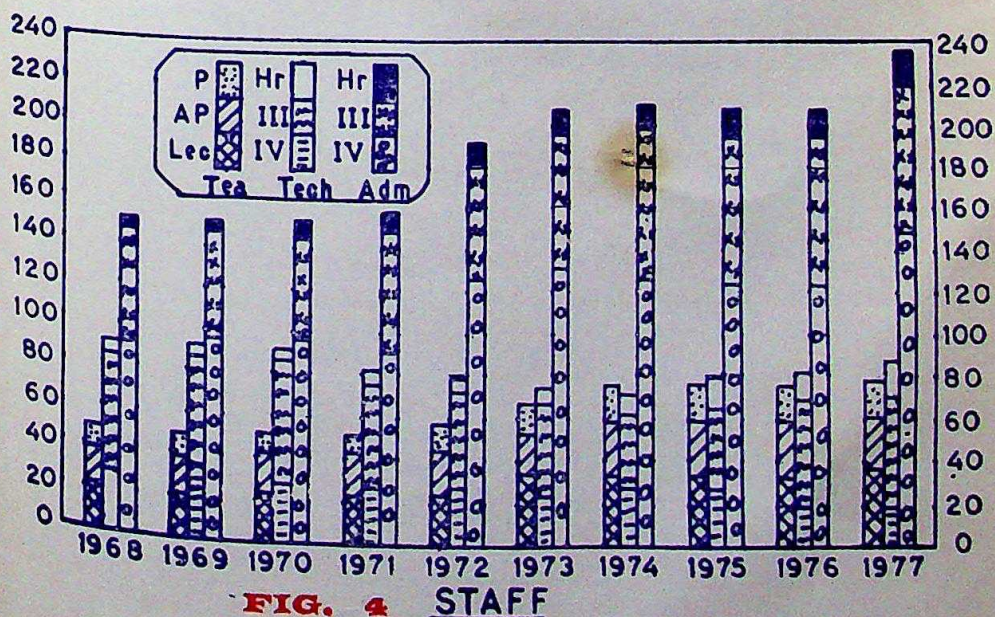
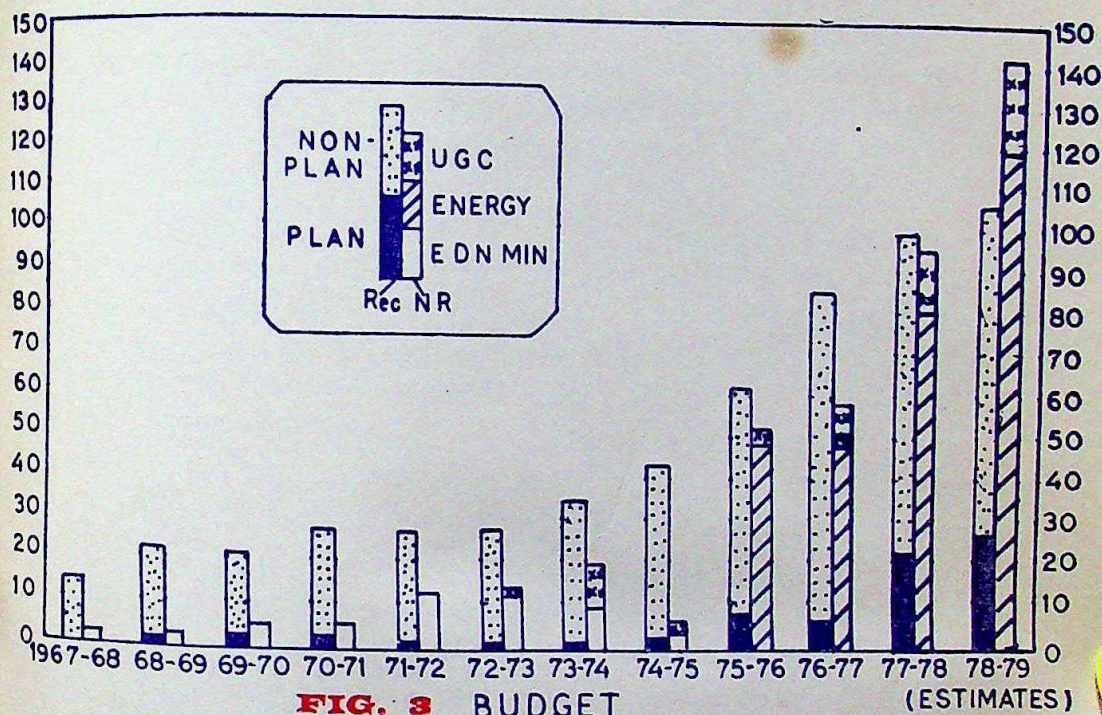
15.2 The total non-plan expenditure of the School during the financial year 1976-77 was Rs. 69.40 lakhs out of which the Government of India paid a sum of Rs 65.00 lakhs, part of which was routed through UGC. The School's own income was Rs 4.40 lakhs. The departmental and other institutional expenses amounted to Rs 16.62 lakhs

For the 'plan' activities a budget provision of Rs 120.64 lakhs had been made, including Rs 90.86 lakhs on building construction. As, however, there were some procedural delays in the CPWD who are the School's sole agency for all building construction, actual Plan expenditure amounted to only about Rs 60.90.

Figure 3 shows the budget provisions of this School over a 10 year period.

15.3 The Establishment Schedule of the School as on 30.6.77, is given in Annexure I (A). Figure 4 shows the variations in the staff strength of the School over a 10 year period.

TEN YEARS AT A GLANCE OF ISM AS A UNIVERSITY



16 ACKNOWLEDGEMENTS

As stated earlier but for the complete and enthusiastic involvement and co-operation from the total ISM community, the Golden Jubilee Celebrations could not have been the success that they were. In particular, the student body co-operated whole-heartedly in all activities and the School authorities are grateful to them.

The School also expresses its thanks to the External Members, Expert Members, etc, on the various School bodies and selection committees, to the many distinguished speakers who delivered special lectures and others who helped in one way or other for the smooth running of its programmes.

The School is grateful to all organisations listed in Annexure VII for the assistance extended to the School in its various activities.

The Government of India in general, and the officers of the Ministry of Education & Social welfare, the Ministry of Energy in the Department of Coal, the Ministry of Finance and the University Grants Commission in particular have been rendering all assistance and support to the School. Considerable R & D and other support has also come from the Central Mine Planning and Design Institute, Bharat Coking Coal Ltd, Manganese Ore (India) Ltd, Tata Iron and Steel Co Ltd, Hindustan Steel Ltd, Coal India Ltd and Hindusthan Copper Ltd. The Executive Board expresses its profound gratitude to all of them but for whose help, guidance and assistance available from time to time, the School would not have been able to make the progress that it has been able to make.

S K BORDIA
Secretary

J G KUMARMANGALAM
Chairman

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ANNEXURE—IA

ESTABLISHMENT SCHEDULE 1977-78.

(I) Regular Posts in existence as on June 30, 1977.

Sl No	Name of post	Scale of pay (Rs)	Sanctioned strength	Staff in Position	No. of Vacancies
1(1)	Director	2500-100-3000	1	1	—
1(2)	Registrar	1300-50-1700 (since then, revised to 1500-2000)	1	—	1
1(3)	Professor of Cont. Education (& Tech. Sec. to Director)	1500-2500	1	1	—
2(1)	Professor	1500-60-1800- 100-2000-125/2- 2500	14 (+1 PPS)	12	3 (2 retirements; one resignation)
2(2)	Visiting Professor	—do—	1	1	—
3(1)	Asstt Professor	1200-50-1300- 60-1900	22 (-1 PPS)	18	4 — 1 (kept in abeyance for promotion made under PPS)
3(2)	Visiting Asstt Professor	—do—	2	—	2
4(1)	Lecturer	700-40-1100- 50-1600	37	33	4
4(2)	Lecturer/Project Officer	—do—	1	1	—
5(1)	Asstt Professor/ Workshop Supdt	1200-50-1300- 60-1900	1	1	—
5(2)	Foreman Instructor	650-30-740-35 880-EB-40-960	1	1	—
5(3)	Asstt Foreman Instructor	425-15-560-EB- 20-640	1	1	—
5(4)	Mechanic Gr 'A'	330-10-380-EB- 12-500-EB-15- 560	2	1	1

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Sl No	Name of post	Scale of pay (Rs)	Sanctioned strength	Staff in Position	No. of Vacancies
5(5)	Mechanic Gr 'B'	260-6-290-EB-6-326-8-366-EB-8-390-10-400	14	14	—
5(6)	Driver	—do—	6	6	—
5(7)	Mechanic Gr 'C'	200-3-206-4-234-EB-4-250	1	1	—
5(8)	Mazdoor (Workshop)	196-3-220-EB-3-232	13	13	—
5(9)	Bus Cleaner/Cleaner	—do—	3	3	—
6(1)	Librarian	1100-50-1600	1	1	—
6(3)	Sr Professional Asstt, SSA	550-25-750-30-900	2	2	—
6(4)	Library Asstt/SA	425-15-500-EB-15-550-20-700	3	—	3
6(5)	Catalogur/ Semi-Prof Asstt	330-10-380-EB-12-500-EB-15-570	1	1	—
6(6)	Library Attendent	210-4-250-EB-5-270	2	2	—
7(1)	Lab Technician	650-30-740-35-840-EB-35-880-40-1000-EB-40-1200	1	—	1
7(2)	Senior Technical/ Scientific Asstt	550-25-750-EB-30-900	15	6	9
7(3)	Instructor	425-15-500-EB-15-560-20-700-EB-25-800	7	7	—
7(4)	Technical Asstt/ Scientific Asstt	425-15-500-EB-15-560-20-700	23	6	17
7(5)	Museum Asstt	380-12-50-EB-15-560	1	1	—
7(6)	Draftsman	330-8-370-10-400-EB-10-480	5	5	—
7(7)	Laboratory Asstt	260-6-290-EB-6-326-8-366-EB-8-390-10-430	2	—	2

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Sl No	Name of post	Scale of pay (Rs)	Sanctioned strength	Staff in position	No of Vacancies
7(8)	Instrument Repairer	260-6-290-EB-6-326-8-350	1	1	—
7(9)	Gestetner Operator (Sr Scale)	— do —	1	1	—
7(10)	Lithopressman	210-4-226-EB-4-250-EB-5-290	1	1	—
7(11)	Section Cutter	— do —	2	2	—
7(12)	Gas Plant Mechanic	— do —	1	1	—
7(13)	Lab Attendant	— do —	16	16	—
7(14)	Gasman/Coal Chaprasi	196-3-220-EB-3-232	3	3	—
8(1)	Physical Training Supdt	700-40-900-EB-40-1100-50-1300	1	1	—
8(2)	Coaches	440-15-515-EB-15-560-20-700-EB-25-750	2	2	—
8(3)	Playfield Mazdoor	196-3-220-EB-3-232	7	7	—
9(1)	Medical Officer	700-40-1100-50-1300(Plus npa)	1	1	—
9(2)	Compounder	330-10-380-12-500-EB-15-560	1	1	—
9(4)	Male Nurse	210-4-226-EB-4-250-EB-5-290	2	2	—
9(5)	Nursing Orderly/ Wboard Bearer	196-3-220-EB-3-232	3	3	—
10(1)	Dy Registrar (Finance)	1100-50-1600	1	-	1
10(2)	Asstt Registrar	700-40-1100-50-1300	3	2	1 (Retired)
10(3)	Accounts/Audit Officer	840-40-1000-EB-40-1200	1	1	—
10(4)	Office Supdt	550-25-750-30-900	4	4	—

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Sl No.	Name of post	Scale of pay (Rs)	Sanctioned strength	Staff in position	No. of Vacancies
10(5)	PA to Director	425-15-500-EB-15-560-20-700	1	1	—
10(6)	Office Asstt	- do -	3	3	—
10(7)	Sr Stenographer	- do -	1	1	—
10(8)	U D C	330-10-380-12-500-EB-15-560	20	20	—
10(9)	Stenographer	- do -	12	12	—
10(10)	L D C	260-6-290-EB-6-326-8-366-EB-8-390-10-400	32	32	—
10(11)	Store-keeper	- do -	2	2	—
10(12)	Gestetner Operator	210-4-226-EB-4-250-EB-5-290	1	1	—
10(13)	Dafttry	200-3-206-4-234-EB-4-250	5	5	—
10(14)	Messenger	196-3-220-EB-3-232	41	41	—
11(1)	Security cum-Estate Officer	650-30-740-35-840-EB-35-880-40-1000-EB-40-1200	1	1	—
11(2)	Chowkidar-Jamadar	200-3-206-4-234-EB-4-250	1	1	—
11(6)	Head Chowkidar	196-3-220-EB-3-232	38	38	—
11(7)	Bearer — cum — Cook	—do—	1	1	—
11(8)	Garden Mazdoor	—do—	7	7	—
11(9)	Safai Mazdoor	—do—	22	22	—

* The post of Professor of Continuing Education was sanctioned by UGC vide its letter No. F. 7-2/75(TE/ER) dated 25.11.75. 75% of the expenditure to be reimbursed by the UGC from out of its own Scheme funds and 25% to be provided for in the Non-Plan estimates of the School.

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(II) V Plan Posts as on June 30, 1977

Sl No.	Nam of post	Scale of Pay (Rs)	Sanctioned strength	Staff in position	No. of vacancies
2(1)	Professor	1500-60-1800-100-2000-125/2-2500	11	5	6
3(1)	Asstt Professor	1200-50-1300-60-1900	11	8	3
4(1)	Lecturer	700-40-1100-50-1600	11	2	9
4(3)	Lecturer/Electronics Engineer	700-40-1100-50-1600	1	—	1
4(4)	Asstt Workshop Supdt	700-40-1100-50-1300	1	—	1
5(2)	Foreman Instructor	650-30-740-35-880-EB-40-960	2	—	2
5(3)	Mechanic Grade C	200-250	2	2	—
5(8)	Mazdoor (Workshop)	196-3-220-EB-3-232	3	3	—
6(2)	Asstt Librarian	650-1200	1	1	—
6(3)	Sr Professional Asstt	550-25-750-EB-30-900	1	—	1
6(4)	Library Asstt/ Professional Asstt/ T A(Reprography)	425-15-500-EB-15-560-20-700	4	3	1
6(5)	Cataloguer Semiprof Asstt	320-10-380-EB-12-500-EB-15-560	1	1	...
6(6)	Library Attendant	210-4-250-EB-5-270	7	2	5
7(2)	Sr Technical/ Scientific Asstt	550-25-750-EB-30-900	3	1	2
7(4)	Technical/Scientific Asstt.	425-15-500-EB-15-560-20-700	5	3	2
7(5)	Glass Blower	380-12-500-EB-15-660	1	—	1
7(6)	Draftsman	330-8-370-10-400-EB-10-480	1	1	—
7(8)	Section Cutter (Sr scale)	260-6-326-EB-8-350	1	—	1

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Sl No	Name of post	Scale of pay (Rs)	Sanctioned strength	Staff in Position	No. of Vacancies
9(3)	Dresser	260-6-326-EB-8-350	1	—	1
10(1)	Deputy Registrar/ Development Officer	1100-50-1600	2	2	—
10(4)	Office Supdt	550-25-750-EB-30-900	1	1	—
10(5)	Office Assistant	425-15-500-EB-15-560-20-700	5	5	—
10(8)	U D C	330-10-380-EB-12-500-EB-15-560	5	2	3
10(9)	Stenographer	330-10-380-EB-12-500-EB-15-560	5	3	2
10(10)	L D C	260-6-290-EB-6-326-EB-366-EB-8-390-10-400	2	2	—
10(11)	Store Keeper	260-6-290-EB-6-326-8-366-EB-8-390-10-400	2	—	2
10(13)	Daftry	200-3-206-4-234-EB-4-250	1	—	1
10(14)	Messenger	196-3-220-EB-3-232	1	1	—
11(2)	Head Chowkidar	200-3-206-4-234-EB-250	1	1	—
11(3)	Head Gardener	200-3-206-4-234-EB-250	2	1	1
11(4)	Guest-House Bearer	200-3-206-4-234-EB-250	1	1	—
11(5)	Safai Jamadar	200-3-206-4-234-EB-4-250	1	1	—
11(6)	Chowkidar	196-3-220-EB-3-232	6	5	1
11(8)	Mali/Garden Mazdoor	196-3-220-EB-3-232	3	—	3
11(9)	Safai-Mazdoor	196-3-220-EB-3-232	3	3	—
			106	58	48

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ANNEXURE I (B)

ADMINISTRATIVE OFFICERS OF THE SCHOOL

Chairman	: Shri J G Kumaramangalam
Director	: Prof G S Marwaha
Technical Secretary to Director and Professor of Continuing Education	: Prof S K Bordia
Registrar	: Shri M S Ramamurthy-upto 30.4.77 Prof S K Bordia from 1. 5. 77 (Concurrent charge)
Librarian	: Miss Sujata Sen
Deputy Registrar	: Major D N Bhattacharjee
Development Officer	: Shri C S Mogra
Assistant Registrars	: Shri B N Sinha : Shri S K Mandal : Shri B K Tikadar-(upto 1. 2. 1977)
Medical Officer	: Dr S N Sinha
Accounts Officer	: Shri Amber Sarkar
Security-cum-Estate Officer	: (Hony Cap) O S Durhaya
Additional assignments	
Chairman, Library Committee	: Prof S Srini-vasan
Vice-Chairman, Sports Club	: Prof S Srini-Vasan
Chief Hostel Warden	: Prof R K Verma
Hostel Wardens	: Dr B L Jha Shri S Rangachari Shri B P Jha Shri N N Haladar
N S S Coordinator	: Shri Mukhdeo
N C C Officer	: Shri S. N. Mahato

LIST OF ACADEMIC STAFF
DEPARTMENT OF APPLIED GEOLOGY

Honorary Professor :

N L Sharma

M Sc; M Sc, (Liv' Pool); F G M S; M M G I

Professors :

S N Sarkar (Head of Department)

M Sc; PhD (Edin); F N A; F G M S; F G S

O P Varma

M Sc; DIC (Lond); PhD (Lond); F G M S;
M M G I

D Chandra

M Sc; PhD (Lond); F G M S; F G S

Assistant Professors :

T Narasimhan

M Sc; PhD (Standford); F G S

Y K Agarwal

M Sc; F G M S; M M G I

R K Shukla (On lien to Directorate of mines and Geology/
Govt. of Gujarat)

M Sc; PhD (Rajasthan)

K L Rai

M Sc; PhD (I S M); Dipl Ore Geol (Oslo/Norway)
F G S; F M S

S N Rai

M Sc; PhD (Patna)

S Basumallick

M Sc; D Phil (Calcutta)

Lecturers :

K S V Ram

M Sc

M S Naik

M Sc; PhD (Karanataka); F G S; F M S

J P Tiwari

M Sc; F G M S

A Hussain

M Sc

(62)

M Prakash

M Sc; PhD (I S M)

K N Jha

M Sc; A I S M (App Geol); A I S M (Min); B L

Supporting Staff :

N H Shastri

M Sc; Dip (Mus) (Senior Scientific Asstt Museum)

Babu Sen Gupta

M Sc; PhD (Senior Scientific Asstt Geo Chemistry)

Harbhajan Singh

B Sc. (Museum Asstt)

DEPARTMENT OF APPLIED GEOPHYSICS

Professors :

R K Verma (Head of Department)

M Sc; PhD (Harvard)

B B Bhattacharya

M Sc; PhD (L' grad) : MLOC (USSR)

Assistant Professors :

R K S Chauhan

M Sc; PhD (Roorkee)

M K Rao

M Sc; PhD (Ranchi)

M Poddar (On lien to NGRI)

M Tech; PhD (I I T Kharagpur)

Lecturers :

B P Jha

M Sc

B N P Agarwal

M Sc; PhD (ISM)

V K Srivastava

M Sc

G Prasad

B E

M Mukhopadhyay

M Sc; PhD (ISM)

Supporting Staff :

R K Agarwal

M Sc (Scientific Assistant)

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DEPARTMENT OF CHEMISTRY, FUEL & METALLURGY

Professor :

T C Rao (Head of the Department)
M Sc; PhD (QLD/Australia); A M Aust IMM;
MIIME

Assistant Professors :

J N Chakrabarti
BSc (Hons); AIIS T (Kanpur); M Inst F (Lond);
C Eng (Lond)

N S Rawat
M Sc; D Phil (Allahabad)

S V B Subbarao
M Sc; M Tech (I I T/Kanpur)

Lecturers :

D Guha
M Sc; PhD (I I T/Bombay)

P K Gangopadhyay
B Sc (Hons); M Tech (Cal); D Phil (Calcutta)

M L Gupta
B Sc; A I C

P Bandopadhyay
A M I E (India); M Tech (Roorkee)

N K Prasad
M Sc (Fuel Tech) (Lond)

Supporting Staff :

S S Asthana
M Sc (Instructor)

R D Ghosh
B Sc (Hons) (Instructor)

J Mandal
B Sc (Instructor)

M M Konar
B Sc; A I C (Scientific Assistant)

S N Dubey
M Sc (Scientific Assistant)

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DEPARTMENT OF ENGINEERING & MINING MSCHINERY

Professors :

K R M Rao (Head of Department)

B E; M Sc (Engg); DR INZ (Poland); Hon SEP;
M (Elec) I S T E

C R C Rao

B E (Mdch); M Tech (Mech) (I I T/Madras)

S K Gupta

(A I S M (Min); MMGI; AMIME (Lond); MGMI;
Certificated First Class Colliery Manager

Assistant Professors i

H Lahiri (Workshop Supdt)

B M E; M I E (India)

D K Mittra

B E E; M Tach (I I T/Kharagpur)

C Sahay

B Sc Engg (Mech); PhD (I I T/Delhi); M I E (India);
M I S T A M

B K Verma

B Sc (Engg) (Mech); M I E

A M Chattopadhyay

B E (Mech); M Tech (Design & Production Engg)
(Burdwan); A M I E (Electrical & Mechanical)

A K Basu

B E (Mech); M Tech (Design & Production Engg)
(Burdwan); A M I E

Lecturers :

P K Ramasubban (On QIP at Roorkee University)

H N C (U K)

R Nanganathan

Grad I E [India]

K K Ray (On QIP at I I T/Kanpur)

B E E

A C Tiwari

B Sc (Engg)

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Supporting Staff :

S K Banerjee

Elec Supervisor's Certificate (Foreman Instructor)

V D Rao

L M E; L E E (Senior Technical Assistant)

D K Bandopadhyay

L M E (Senior Techoical Assistant)

A K Das Gupta

L M E (Senior Technical Assistant)

S M Mahato

D M E; A D F T (Instructor)

S K Sinha

(Diploma in Tech) (Technical Assistant)

D K Mukhopadhyay

L M E (Technical Assistant)

P S Mukherjee

L M E (Technical Assistant)

H S Ghosal

L E E (Asstt Foreman Instructor)

DEPARTMENT OF HUMANITIES & SOCIAL SCIENCES

Assistant Professor :

D P Jha (Head of Department)

M A (Pol Sc)

Lecturers :

S K Basu

M A (Phil)

R K Singh

M A (Engl)

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DEPARTMENT OF INDUSTRIAL ENGINEERING & MANAGEMENT

Professor :

D K Sinha (Head of Department)

B Sc (Min Engg); M Tech (IE & OR) (IIT/Kharagpur);
PhD (Moscow); M I E (India); M O R S I; M I I E;
M G M I; Certificated First Class Colliery Manager.

Assistant Professor :

Prabhakar Singh

M A (Psy) (Gorakhpur); PhD (Industrial Psy)
(Kashi Vidyapith)

Lecturer :

M S Cheema

B Sc (Hons) (Min); M Tech (IME) (IIT/Kanpur)

Supporting Staff :

D Ghosh

B Sc (Hons); P G Dip O R
(Senior Scientific Assistsnt)

DEPARTMENT OF MINING ENGINEERING

Professors :

R D Singh (Head of Department)

A I S M (Min); M Sc (Min); F I Min E (Lond);
F I E (India); M M G I; C Eng (U K); Certificated
First Class Colliery Manager

S D Singh

A I S M (Min); M M G I; Certificated First Class
Metalliferous Mine Manager

A K Ghose

A I S M (Min); F I E (India); F I Mine E (Lond);
M A M I M E; M M G I; C Eng (U K); Certificated
First Class Colliery Manager

S P Banerjee

A I S M (Min); B Sc (Hons) (Min); M E (Min) (Sheff);
PhD (Sheff); F I E (India); M M G I; Certificated
First Class Colliery Manager

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B K Mozumdar (Tata Steel Chair in Opencast Mining)

A I S M (Min); B Sc (Hons) (Min); M Sc (Min) (ISM);
M S (Min) (Penn State); PhD (Penn State); Certificated
First Class Colliery Manager

A K Mishra (Visiting Professor)

B Sc (Min); PhD (Sheff); M I M in E (Lond); C Eng
(U K): Certificated First Class Colliery Manager (U K
and India)

Assistant Professors :

P R Prasad

B Sc; B Sc (Min); D M C; M I M E; Certificated First
Class Colliery Manager (U K)

N K Patnaik

B Sc (Hons) (Min); A I S M (Min); Certificated First
Class Colliery Manager

S P Ahuja

A I S M; B Sc (Min); Certificated Second Class Colliery
Manager; Certificated Mine Surveyor (Coal)

V P Singg

B Sc; A I S M (Min); B Sc (Hons) (Min); M S Engg
(Min) (Queen's Canada); Certificated First Class Colli-
ery Manager

B K Kejriwal

A I S M (Min); B Sc (Hons) (Min); M I E (India)
Certified First Class Colliery Manager

M S Chhabra

B Sc; B Sc (Hons) (Min); A I S M (Min); M M E A;
Certificated First Class Colliery & Metalliferous Mine
Manager.

Lecturers :

Alam Chand

A I S M (Min); B Sc (Hons) (Min); Certificated Second
Class Colliery Manager; Certificated Mine Surveyor
(Coal & Metal)

A R Ansari (ON QIP at Roorkee University)

A I S M (Min); B Sc (Hons) (Min); M E (Civil)

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V K Srivastava

M Sc (Civil); Certificated Mine Surveyor (Coal)

D S Nagda

A M I E (Min); M Phil (Leeds)

Supporting Staff:

U P Mukheree

D E E; Electrical Supervisor's Certificate (Senior Technical Assistant)

K N Prasad

Equ Dip (Elect & Telecommunication); Elect Supervisor's Certificate (Bombay); Foreman Certificate of Competency (Indian Navy) (Senior Technical Assistant)

S P Jha

D M E (Instructor)

H N Haldar

B Tech (Min) (Instructor)

Harendra Singh

D M E (Research Assistant)

DEPARTMENT OF PETROLEUM ENGINEERING

Professors :

S Srinivasan (Head of Department)

B Sc; B S P E (Texas); M P E (Tulsa USA); Pi Epsilon Tau (U S A); Mem S P E & A I M E (U S A); F I E (India); C Eng

N V R Subrahmanyam

B Sc (Hons); M Sc; D I C (Lond)

Assistant Professors :

B P Pandey

B Sc (Hons) (Pet); A I S M (Pet Engg); M Tech (Chemical Engg) (I I T/Kanpur); PhD (I I T/Kanpur)

G S Mony

B Sc; B Sc (Chemical Engg); M S P E & A I M E (USA); M I E (India)

S K Bajjal (On deputation to University of Benin, Nigeria) (Africa)

B Sc; M S (Pet Engg) (Texas); PhD (Phys Chem) (Gorakhpur)

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Lecturers / Project Officer :

K K Rao

M Sc (Tech); Grad I T E; F I S I

Lecturers :

H K Mukhopadhyay (On extraordinary study leave in the U S A)
B Sc (Pet Engg); A I S M (Pet Engg); M S (Pet Engg)
(Tulsa)

S K Sen Gupta

B Tech (Pet Engg)

Supporting Staff :

M K Chaudhary

B Sc (Scientific Assistant)

P V Unnikrishnan (resigned May 21, 1977)

B Sc (Scientific Assistant)

A K Srivastava (from 24-5-77)

B Sc (Scientific Assistant)

DEPARTMENT OF PHYSICS & MATHEMATICS

Professors :

S N Mitra (Head of Department)

M Sc

K R Nag

M Sc; PhD (Jadavpur)

Assistant Professors :

D Chandra

B E (Hons) (Electronics); M Tech (I I T/Kharagpur)

B L Jha

M Sc; PhD (I I T/Kanpur)

Lecturers :

M L Chaudhury

M Sc; D Sc (Calcutta)

S Rangachari

M A. M Sc; M Tech (I I Sc)

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P R P Rao

M Sc

B K Kar

M Sc

G Joshi

M Sc; PhD (B H U)

S K Dey

M Sc; PhD (Ranchi)

Mukhdeo

M Sc

L N Upadhyay

M Sc; PhD (BHU)

Supporting Staff :

K D Gupta (on Study Leave)

M Sc (Instructor)

A Chattopadhyay

M Sc; (Scientific Assistant)

M P Verma

M Sc (Scientific Assistant)



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ANNEXURE II

The University Grants Commission appointed a Committee with the following members to examine the proposals of the Indian School of Mines, Dhanbad for the 5th Plan period :—

1	Prof V L S Bhimsankaram Head of the Deptt of Geophysics Osmania University Hyderabad	Convenor	
2	Prof R N Mukherjee Prof of Chemical Engg Jadavpur University Calcutta-32		Nominees of U G C
3	Shri S S Prasad Director-General Mines Safety Dhanbad		
4	Prof S S Saluja Director Institute of Technology Banaras Hindu University Varanrsi		
5	Dr M G Krishna Director Central Fuel Research Instt Dhanbad		Nominees of the A I C T E
6	Dr T C Bagchi Head Deptt of Geology & geophysics I I T Kharagpur		
7	Shri R N Sharma Chairman-cum-Managing Director Bharat Coking Coal Ltd P O Jharia Dhanbad		
8	Shri H B Ghose Managing Director Coal Mines Authority Ltd Central Mines Planning & Design Institute Darbhanga House Ranchi		Nominees of the Deptt of Coal, Govt. of India

- 9 Shri L R Mal
 Education Officer
 University Grants Commission
 New Delhi

Secretary

The Committee visited the Indian School of Mines, Dhanbad on 7th & 8th August, 1975 Shri S S Prasad could not join the Committee. but instead nominated Shri H S Ahuja, Director, Mines Safety, who attended the meetings of the Committee on his behalf. Prof S S Saluja joined the Committee on 7th August, 1975 only while Dr. M G Krishna attended the meetings of the Committee on 8th August. 1975.

The Committee held discussions with the Director, Heads of the Departments and other members of the faculty, Students and the staff. The Committee went round the campus and visited the laboratories, the academic blocks, the library and student residences.

**Background &
Present Position**

The Indian School of Mines was set up by the Government of India in 1926 on the model of Royal School of Mines, London as the premier mineral-technology Institute in the country. It is the largest mining School in India and over half of the mining engineers in the field are stated to be its alumni. Its Geology Department is also stated to be one of the oldest. ISM is stated to run the only programme in the country leading to the grant of B Tech in Petroleum Engineering and is one of the six Centres of Study in Applied Geophysics in India, these two departments having been created about two decades back. The School has an area of about 208 acres and is fully residential.

The Indian School of Mines, Dhanbad was declared to be an Institution deemed to be a University under Section 3 of the UGC Act in 1967. Until then the School was directly administered by the Government of India from its very inception. Till recently, the maintenance grant to the School was provided by the Government of India. At present, both maintenance and development grants are provided by the University Grants Commi-

ssion. The general Superintendence, direction and control of the affairs of the School is vested in the Executive Board which acts as a governing body of the School. The School was initially awarding its own associateship, but after its declaration as an institution deemed to be a University, it has been awarding Degrees. The School was started with only two courses viz., Mining and Applied Geology. In 1957, it added two more courses viz., Applied Geophysics and Petroleum Engineering.

The School is currently running a five-year integrated undergraduate B Tech. programme in Mining Engineering and Petroleum Engineering. A parallel programme in Applied Geology and Applied Geophysics leads to the award of the B Sc/B Sc (Hons) courses after the third-year and the M Sc Degree after the fifth year.

Admission to all these courses is through All India competitive examinations open to persons who have passed at least the higher secondary stage or its equivalent. A limited number of meritorious students from Indian universities and of foreign students is admitted directly. A limited 'make-up' admission is also made at the third year of the five-year programmes in Applied Geology and Applied Geophysics from amongst applicants already holding a first degree in Geology or Physics/Chemistry from other universities.

A two year M. Tech course in Mining and Mine Planning was started by the ISM in 1972-73. The Industry oriented programme offers specialisation in rock mechanics/open pit stability design of blasts/mine environment/sand stowing/mine planning and design/application of computers to grade control.

In 1974 a one year post-graduate diploma course in Coal machinery was started with the support of Bharat Coking Coal Ltd.

The details of the courses which the school is now conducting their duration and annual intake are given below :

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<u>Under Graduate Courses</u>	<u>Duration</u>	<u>Annual intake</u>
1 B Tech (Mining)	5 years	60
2 B Tech (Pet Engg)	5 years	15
3 B Sc (Hons) M Sc (Applied Geology)	3/5 years	15
4 B Sc, M Sc (Applied Geophysics)	3/5 years	15
5 B Tech (Mining) (condensed course for Diploma holders)	3 years	20
Total		125

Post Graduate Courses

1 M Tech (Mining and Mine Plg)	2 years	6
2 D I S M (Coal Mining machinery) financed by Bharat Coking Coal Ltd.	1 year	

A statement indicating the student population in various courses during 1975-76 is attached (Annexure-I)

**Forth Plan
Developments**

The Committee appointed by the University Grants Commission to examine the requirements of the Indian School of Mines, Dhanbad during the Forth Plan period visited the School in August 1971. The Commission accepted the recommendations of the Visiting Committee and allocated the following grants for different departments :-

Non-recurring

(Buildings,	Rs. 25 lakhs	(Building	Rs. 11.63 lakhs
Equipment &		Equipment	Rs. 8.67 lakhs
Books)		Books	Rs. 2.25 lakhs

Recurring

(Staff, Fellowships & maintenance)	Rs. 2.00 lakhs per annum
---------------------------------------	--------------------------

The School however could not utilise any substantial portion of the allocation during IV plan partly due to

ban on the construction of buildings and also due to the fact that the mining activity in the country was at a low ebb and consequent to less demand for these courses. The additional space sanctioned for academic activities also could not be constructed.

The Committee had made the following recommendations :-

- 1 Geology is a highly specialised subject and requires training in disciplined knowledge and specialisation. An uniformity in its course and content as obtaining in the country, was desirable and could perhaps be achieved by designing the existing course of 4 plus 1 years duration leading to B Sc and M Sc in Applied Geology into the usual pattern of 3 plus 2 years for B Sc and M Sc in Applied Geology. At the end of the 6th year, the students could appear for an examination leading to the degree of M Sc (Tech) or a postgraduate diploma in Applied Geology. There should be a minimum intake of ten students in the B Sc class.
- 2 Provision should be made by the School for registration for PhD work in Physics, Chemistry and Engineering. This would encourage research in the service departments of the School which would act as an incentive to attract and retain qualified staff in these departments.
- 3 Introduction of short-term courses for periods of 3 to 6 months or even upto a year in Labour Relations, Economics of Mining, Project Planning, Management Techniques etc. for in-service personnel as well as unemployed mining graduates.
- 4 Introduction of a two-year postgraduate industry oriented M Sc course in mining with a minimum intake of 6 students, half of which should be sponsored by the industry.
- 5 5-year integrated course in petroleum Technology should permit elective groups during the last two years in Petroleum Refinery, Transport and Distribution, and Petroleum Products.

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With regard to the implementation of the above recommendations, the committee was in formed as under :—

- 1 The restructuring of the courses in Applied Geology and Applied Geo-physics as recommended by the Fourth Plan Visiting Committee has been implemented. With regard to the institution of the degree of M Sc (Tech), the course would be started when additional space is available. However, planning for the course has already been done.
- 2 Provision has been made for registration for PhD work in Physics, Chemistry and Engineering and research scholars are doing PhD and M Sc (Tech) by Research.
- 3 This has been implemented and short-term courses of the duration of one to three months have already been held. So far the duration of such courses held works out to about 500 participants weeks. This number will increase approximately @ 20 to 30% every year. The simple short-term courses are handled by the staff of Indian School of Mines, Dhanbad but in the case of others. there is participation by experts from outside agencies also.
- 4 The School started a two-year post-graduate industries oriented M Sc courses in Mining in 1973. In the first-year the course had five students who were all sponsored. No admissions could be made in 1974, as the 1973 admissions were made quite late. In 1975, five sponsored candidates have again been admitted to the first-year in this course. The course is designed in accordance with the needs of the industry. The first year of the course has an examination while the second-year is project-oriented. For this course guest-lecturers from the industries are also invited.
- 5 The School Faculty considered this recommendation and were of the view that without additional

staff, it would not be possible to permit elective groups during the last two years in the five-year integrated course in Petroleum Technology. For Petroleum refining a good background of chemical engineering is necessary. The School proposes to take this up in the Sixth Plan period. However, if the Oil & Natural Gas Commission provide some additional money to the School, this could be started with the help of additional staff.

**Discussions
with Director
Teachers &
Students.**

During the course of discussions with the Director, the Committee was informed that when the School was given the status of an Institution deemed to be a University under the UGC Act, the demand for its product was at a very low ebb, the mining industry being in a state of deep stagnation. Though a few years earlier it used to admit 150 students a year in four disciplines (90 in Mining and 20 each in Applied Geology, Applied Geophysics and Petroleum technology), these admissions had been brought down with effect from 1964-65 session to 65 (25 in Mining and 15 each in Applied Geology and Applied Geophysics and 10 in Petroleum Technology). As a result, the demand on infrastructure remained low over most of the fourth Plan period and this had been the main weakness of the School right through. The School is still short of hostel seats and teaching space. In view of the present energy crisis, the School is making concerted efforts to play the role expected of it as the premier mineral technology Institute. It has increased the intake to its five-year integrated B Tech. mining programmes from 25 to 60 in addition to starting a three-year whole-time condensed B Tech. mining degree course for diploma holders in mining. The intake to the B Tech. Petroleum Technology programme has also been increased from 10 to 15. The School has also cut fresh ground in its efforts to serve the mining industry by starting a one-year sandwich pattern industry-oriented postgraduate programme in coal mining machinery for degree holders in electrical/mechanical engineering freshly recruited by the coal mining industry. A condensed three-month post-

graduate programme in the same subject for engineering graduates already employed by the mining industry was arranged in 1973-74. A similar programme in Petroleum Engineering for engineering graduates already working in the Petroleum industry concluded in July, 1975. The Director further pointed out that the School has a strong research programme in several areas in geo-sciences as well as mining and petroleum engineering; and has on its rolls over 25 scholars and fellows carrying out research work for M Sc/M Tech. and PhD degrees in various disciplines-including Mining Engineering, Mining Machinery, Electrical Engineering, Electronics, Applied Geology, Applied Geophysics. Chemical Engineering, Chemistry, Ceramics, Fuels, Physics and Mathematics.

Thirteen PhD's have already been awarded by Indian School of Mines. He also informed the Committee that the School is making efforts to strengthen research and development activities particularly in the following areas :-

Mineral Exploration; Economic Geology; Structure and Tectonics of Mineralised Zones; Geophysical; Thermal. Gravity and Magnetic Surveys; Studies in the field of Paleomagnetism and Geodynamics; development of Seismic and Electrical Methodology for Geohydrological problems;

Mine Methods and Systems; Open-pit Planning and Design; Rock Mechanics; Stability of Ground; Mine Workings and Mine Slopes, Assessment of Environmental Problems in Mining; Problems of Transport; Drainage and Corrosion; Mineral Beneficiation;

Development of Electronic instrumentation; Electronic Drives and Controls; Workshop Layouts and Maintenance Systems;

Rheology of Waxy and Viscous fluids; Sand Control in Oil/Gas Wells; Hydrate problems in h p Gas Transmission System; Oil Stimulation; and Secondary Recovering methods.

In addition to research support received from CSIR and UGC (by way of grant of research fellowships) R & D support is being negotiated for a project which has been sanctioned by the Electronics Commission, ONGC and Ministry of Energy, ISM has also been identified by National Committee for science and technology as one of the premier centres of mining research in the country.

It was also brought to the notice of the Committee that the School participates in international collaborative programmes as below :-

Moscow Mining Institute, Moscow Geological Institute	Exchange of teachers in fields of mine system design; coal sedimentology petroleum exploration and genesis.
Institute of Science of Earth, Moscow	Studies in Geomagnetic and Geoelectric Micro- pulsations.

Academic and research collaboration arrangements have been made with the Krakow Academy of Mining and Metallurgy (Poland). Similar arrangements are under negotiation with the Gliwice Polytechnic (Poland) as also research collaboration in under-ground ventilation and climatic conditions in coal mines with West German Research institutes.

During the Fifth Plan, the thrust of the programmes of the School would be towards re-orientation of identifiable engineering functions in the employment sector, even if it means a major re-organisation of the framework of structure of training programmes to reach the static objective by a variety of operational measures. While undergraduate programmes could devote themselves to the application of engineering to manufacture, planning and management functions, postgraduate programmes would be structured to provide for research and design development functions. The School believes in the philosophy that technical institutions should not represent merely an additional complex, but must contribute effec-

tively in certain well-defined areas, like research into practical problems, design, development processes and equipment, preparation of feasibility studies and project reports, technical and consultancy services to engineering enterprises etc , and in short a variety of functions having a bearing on community development. Another traditional garb, which technical Institutions may have to discard is the limited (and narrow) objective of equipping a person with skills just adequate to facilitate entry into the profession. The skills to be imparted and the techniques to be taught will have to be so designed and developed that rapid advancement in the professional field becomes possible through early identification with the professional objectives. In framing its Fifth Plan developmental proposals, the School has also taken into account the importance which the national planners have attached to the development of mining and manufacturing sectors. The recent crude oil and energy crisis and the resulting foreign exchange squeeze have greatly accentuated the urgency of fast and national development of the mineral industry. Being the premier institution in the field of mineral technology, the School is being called upon to shoulder an enormous responsibility in training and providing the right type of professionals competent to explore and exploit and utilise the mineral wealth of the country. Keeping this in view, the Government of India, Department of Coal have agreed to provide a special allocation of Rs. 3.17 crores for the development of the Indian School of Mines, Dhanbad during the Vth Plan period.

During the course of the discussion with Teachers' Association, the following points were made :—

- 1 There is no representation of the Teachers on the Executive Board. The Teachers' Association has not been recognised so far.
- 2 The grade of Instructors has not been revised.
- 3 The School does not have any firm policy on promotion of teachers stagnating in particular post for a very long time.

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4. No incentive is provided to teachers who obtain Ph.D. degree while working in some of the departments whereas in the same School sufficient incentive exists to teachers in other departments who acquire additional qualifications.

5. There is no proper assembly hall where cultural functions could be held.

6. Teachers find it difficult to purchase textbooks. The School library may have enough copies of the textbooks for the use of teachers.

During the course of discussion with the students, the following points emerged :

1. The number of scholarships available to the students is not enough and should be increased (the Committee was informed by the Director that about 60% of the students are covered by one scholarship or the other and 10% get free tuition. All scheduled caste and scheduled tribes students get scholarship from the respective State Governments).

2. There should be merit scholarships not tied to means.

3. Some allowance/stipend should be paid to the students when they are undergoing training at other places.

4. The number of text-books in the library should be increased. (The committee was informed by the Director that the School has already started a Book-Bank with UGC assistance. Apart from this a British Council grant of £ 4,000 has also been utilised. These would improve the availability of text-books to the students).

5. Enough provision for extra-curricular activities does not exist and these should be augmented. (The committee was informed that the School has the system of indirect elections to the ISM Students' Society. There are horizontal and vertical elections for this purpose. A student pays Rs. 15/- per annum and this is matched equally by the School. The amount is utilised in consultation with the students and the School has already a

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number of cultural and professional societies which organise activities in these areas).

6 Audio-visual aids should be used in teaching.

7 The School does not have a Stadium and a Swimming Pool and should be provided with these facilities.

8 Better medical facilities should be provided for the students. The existing facilities are not adequate.

9 The students would prefer the School shifting to semester system.

10 There is need for revision of the curriculum which should be in tune with the present day requirements. (The Boards of Studies, the committee was informed by the Director, are working on reconstruction of courses at various levels).

**Fifth Plan
proposals.**

The Committee examined the 5th Plan proposals of the Indian School of Mines, Dhanbad. The School plans not only to strengthen the existing facilities which has been necessitated because of increase in the intake of students but also to start new courses (graduate and post-graduate condensed courses for diploma holders, refresher and short-term courses as part of continuing education) which have a bearing on the mining problems. This has necessitated increased requirement of staff, laboratory space equipment and other supporting facilities.

In view of the acute energy crisis and the importance of minerals to national economy in the 5th Plan and subsequently, a special effort has to be made to augment the existing educational facilities in mining and other mineral sciences. This is all the more necessary when very large scale projects are being planned and modern technology has to come in a big way to meet the challenge of very high rates of production with large scale mechanisation on the one hand and new mining techniques to be adopted on the other.

The plans for effective utilisation of the available resources and of finding new ones give a new background to the role that could be Played by the Indian School of

Mines, Dhanbad. For instance, the plans of doubling or even trebling the coal output of the country demand from the School a substantial expansion and a new outlook for meeting the demands of the coal mining industry. It is not only a task of training fresh graduates in its integrated courses to man the new mines that are being opened but also of providing continuing education, of imparting new methods and techniques to the existing engineers employed in the mines and of training the middle level technicians to make them full fledged engineers. The School has, therefore, three clear objectives to fulfil :-

- (a) Increasing the intake of fresh graduates;
- (b) Elevating the level of diploma holders who are already employed; and
- (c) Providing short-term refresher courses, workshops, practical orientation, adoption of new techniques etc. as part of continuing education to the engineers employed in the mining industry.

The Indian School of Mines is one of the prestigious institutions engaged in training in mining and other related fields. Many of its alumni have proved worthy of their profession by contributing scientific and technical knowledge in the growth of mining industry in the country. It is ideally located to cater to the special and urgent needs of the mining industry and it is very important that it should be encouraged and helped to develop faster into a first-rate all-India centre of mining engineering and allied engineering branches as also related disciplines. The Committee is happy to record that the School appears to have turned a new leaf during the last 2-3 years and one could see that there is more dynamism at present as also a strong urge for achieving the academic target in a big way. The School has established a good linkage with coal mining industry by providing short-term courses for sponsored candidates and inviting experts from industries to run short-term Courses. The Committee, however, observed certain weaknesses in the running

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of the institution which are listed in the general recommendations.

Recommendations.

The Committee has kept the following points in view while examining the proposals :-

- (a) The requirements of the industry and the necessity for preparing are not only generalists but also specialists to man particular developmental activities of the industry.
- (b) Demands of the industry for specialised training in certain branches like mine machinery, mine survey etc.
- (c) The academic viability and industrial necessity of the courses proposed to be started.
- (d) Existing position of staff, laboratories, teaching space, equipment, library services etc.
- (e) The availability of special allocation of Rs. 3.17 crores from the Department of Coal.

The Committee noted that based on the recommendations of the 4th Plan visiting committee, the Commission has already accepted the following projects for implementation during the 5th Plan period :-

1. Building for the mineral dressing laboratory ..Rs. 11.13 lakhs
2. Science block (1st & 2nd floors with an area of 14,500 sq. ft.) ..Rs. 21.70 lakhs

The Committee also noted that the UGC has agreed to the School constructing a Hostel for 200 students at an estimated cost of Rs. 33.17 lakhs. The total commitment of the three projects indicated above, amounts to Rs. 66.0 lakhs. The recommendations of the Committee for various departments and other facilities are given below.

—: ॐ :—

DEPARTMENT OF MINING

The Department has 5 Professors (including one visiting professor), 6 Asstt. Professors (including one visiting Asstt. Professor) and 3 Lecturers. Besides, the undergraduate programme leading to B. Tech. (Hons) in Mining Engineering and a condensed degree programme (which was started in 1973-74) the Department has been offering a postgraduate industry-oriented programme leading to M. Tech. (Mining) degree since 1972-73. The Department has during the past two decades reoriented itself for R&D work with the result that some of the pioneering studies in India on physio-mechanical properties of coal, explosibility of coal dust and ventilation studies have been carried out in this Department. It has also been active in the programmes of continuing education in the field of Mining engineering with course offerings ranging from specialised courses in rock mechanics and ground Control and mine ventilation to course modules on mining technology. Apart from undertaking a number of important research projects, the Department has also helped in consultancy assignments.

The Committee approved the institution of the following new courses by the School during the 5th Plan :—

- (a) Three-year B. Tech (Mining) condensed degree courses for diploma holders with an intake of 20 per year.
- (b) Two-year M Tech in open-cast mining with an intake of 6 per year.
- (c) One-year CISM programme in Mine survey and planning with an intake of 10 per year.

The Committee desired that the School may reconsider its proposal for starting M. Sc. Mining Engineering course by research. A part of this course should be structured course and the boys should take M. Tech. degree.

For the consolidation and strengthening of the existing activities the Department and for starting new programmes, the Committee recommends the following :—

- | | | |
|-------------------|---|--|
| Professors | : | 3 (one in mine system design one in open cast and in mines survey). |
| Asstt. Professors | : | 3 |
| Lecturers | : | 5 (Two of the five lecturers may be located in different deptts. depending upon the type of inputs needs for students comming from different stream into M. Tech. Open Cast Mining. |

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Senior Research Fellowship	: 1
Junior Research Fellowship	: 2
Research Contingencies	: Rs. 50,000 per annum.
Equipment	: Rs. 9.00 lakhs.
Additional space	: 15,000 sq. ft.

On the recommendation of the 4th Plan visiting Committee, the Commission agreed to the School building a model mine in stages and allocation of Rs. 1.50 laks was agreed. In the 5th Plan proposals, the School in stead wanted to have experimental mining facilities (through rehabilitation of an old mine) for purposes of training and research. This facilit the School felt, could also be developed to serve as a mining museum in :collaboration with the Birla Industrial and Technological Museum of CSIR. The Committee recommends that an amount not exceeding Rs.2.50 lakhs may be provided to the School during the 5th Plan for the development of an experimental mine-cum-mining museum.

DEPARTMENT OF PETROLEUM TECHNOLOGY

The course in Petroleum Technology was started at the School in July, 1957 for the training of petroleum engineers. The Department has the following staff :—

Professors	: 2
Asstt. Professors	: 4
Lecturers	: 3 (including a project Officer)

The regular academic programme of the students is supplemented by appropriate field training in the oil fields in various field operations such as drilling, production etc. The students, by the time they graduate, have to undergo practical training for a minimum period of 4 months at the Institute of Petroleum Exploration Training rig and in the oil fields operated by the Oil and Natural Gas Commission, the Oil India Ltd., and the Assam Oil Company. The Department is making sincere efforts to establish a base for R&D programmes. The Department conducted a three-week course in Petroleum Technology for the technical Officers of the Assam Oil Company and the Oil India Ltd. during 1974. This was followed by a week long course in Zonal Evaluation and Reservoir Engineering at Digboi (Assam). In July, 1975, an intensive refresher course in

Petroleum engineering was conducted for the production engineers of the Oil and Natural Gas Commission. In the course of time, the Department hopes to run more such programmes of continuing education. The Department is also planning to start a postgraduate diploma course in Petroleum Production Engineering or Drilling Engineering and efforts are being made to induce the Oil industry to sponsor technical personnel to this course.

For the consolidation and improvement existing teaching and research facilities, the Committee recommended the following :—

Sr. Research Fellowship	— 1
Jr. Research Fellowships	— 2
Equipment	— Rs. 2.75 lakhs
Research Contingencies	— Rs. 10,000 per annum
Additional space	— 2,500 sq ft.

The Committee reiterates the recommendation made by the Fourth Plan Visiting Committee that the Five year integrated course in Petroleum Technology should permit elective groups during the last two years in Petroleum Refinery Transport and Distribution and Petroleum Products. The ISM should take up with the ONGC the question of sponsoring some specialisations in Petroleum Engineering.

DEPARTMENT OF APPLIED GEOLOGY

The Department is stated to be the oldest academic centre of applied Geology in the country established in 1926. The thrust areas of the department are :—

- (1) Coal Geology; (2) Stratigraphy and techtonics of pre-cambrian mineralised belts; and (3) mining Geology and mineral exploration.

Apart from running its own B Sc (Hons) and M Sc programmes in applied Geology, the Department also imparts training to the students of Mining Engineering, Petroleum Technology and Applied Geophysics programmes. To give a certain degree of specialisation, students of applied geology are given option for one of the electives viz., (1) Mineral exploration (2) Coal Geology (3) Petroleum Geology (4) X-ray crystallography and Spectro-chemical analysis (5) Silicate analysis (6) Advanced Stratigra-

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phy. The Department has two Professors, four Assistant-Professors and eight Lecturers and is assisted by a reasonable contingent of supporting staff. The faculty members have already made a mark in India in the field of earth sciences. The syllabi are well-balanced and application oriented. The existing staff is sufficient to run the present courses viz., M Sc and M Sc (Tech) Applied Geology.

The Commission noted that the Planning Commission based on the recommendation of NCST have-agreed to the School setting up a Centre for Higher Studies in Ore Deposits. This would not involve any financial liability on the UGC. The Planning Commission have also sanctioned a scheme for starting postgraduate course in Engineering geology. The Committee felt that this should be called a Diploma in Engineering Geology and not M. Tech as proposed by the School propose to start a postgraduate course in ore studies. The Committee is not in favour of the School starting a postgraduate course in ore studies and is unable to sanction any provision for this purpose.

The Committee recommended the following additional staff and other facilities for consolidation of the existing programmes and for higher studies in ore deposits :—

Professors	: 1 (Engineering Geology if the diploma course is started)
Asstt. Professors	: 2 (one for ore Geology and one for Coal Geology).
Sr. Research Fellowships	: 2
Jr. Research Fellowships	: 4
Equipment	: Rs. 4.00 lakhs
Additional space	: 5.000 sq. ft
Sr. Tech. Assistant (Geo- Chemistry)	: 1
Tech. Assistant (Museum Asstt.)	: 1
Section Cutter (Sr. Grade)	: 1
Research Contingencies	: Rs. 10,000 per annum
Field work	: Rs. 15,000 per annum

DEPARTMENT OF APPLIED GEOPHYSICS

The Department was started in July, 1957 and the first batch of students was awarded the degree of B Sc. (Hons.) in applied Geophysics in 1960 and M. Sc. in applied Geophysics in 1961. The Department has at present 2 Professor, 2 Asstt Professors and 4 Lecturers. It runs a five-year integrated Course leading to M. Sc. in Applied Geophysics. Since the first batch in 1961 to the last batch in 1975-186 students have taken the M. Sc. degree. So far 9 persons have been awarded PhD in applied Geo-physics either by the Indian Schools of Mines or by the Ranchi University to which this Institutions was affiliated till 1967. Three more have submitted their PhD thesis. The Department has 12 research scholars working on different projects. While some of the projects handled by the faculty are problems of exploration of mineral deposits, a large number of these however are on subjects which are connected with mineral like seismotectonics and seismicity of India (CSIR Project), Palaeomagnetism etc. Since the School has its main thrust area in mining, the committee recommends that more & more schemes and research projects should be taken up by this Department in the field of Mining Geophysics, and the existing facilities need not be utilised for research work not connected with natural resources.

The staff at present employed appears to have adequate work. However, the space with them is inadequate and the Department also needs additional equipment. The Department proposes to start an M. Sc. (Tech) degree course in Mining Geophysics. The Committee recommends the following additional facilities for this Department for the 5th plan period :—

Professor	1
Lecturer	1
Sr. Research Fellowships	1
Jr. Research Fellowships	2
Research Contingencies	Rs. 20,000 per annum
Equipment	Rs. 5.0 lakhs
Additional space	1,000 sq. ft.

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DEPARTMENT OF ENGINEERING AND MINING MACHINERY

This Department till 1973 was known as Department of Engineering and has existed since the inception of the School, serving the students of Mining with core subjects in Engineering and machine drawing. Until 1973, the Department served as a service department but after the nationalisation of the coal mining industry early that year, ISM started imparting training in mining machinery to newly recruited electrical/mechanical engineers of the Bharat Coaking Coal Ltd. In recognition of the new activities undertaken by the Department, its name was changed in 1973 to the Department of Engineering and Mining Machinery. The Department run a 13 week intensive course in coal mining machinery for colliery engineers during 1973-74. To suit the requirement of the coal mining industry, the Department organised in 1974, a one-year sandwich pattern postgraduate course in coal mining machinery for a batch of 40 fresh electrical/mechanical engineers recruited by BCCL. The second batch of 50 such engineers was admitted in 1975. In addition to the regular academic and training programmes, the Department is actively involved in R&D activities. The Department has on its staff 2 Professors, 5 Asstt. Professors and 3 Lecturers in addition to supporting technical staff.

The Committee examined the proposals of the Department and recommends the introduction of the following courses :—

- 1 One-year postgraduate DISM programme in coal mining machinery for electrical/mechanical graduates.
- 2 A three-month course in coal mining machinery/metal mining machinery and open-cast machinery.
- 3 A three year condensed B. Tech. programme in mining machinery for diploma holders in electrical/mining engineering.
- 4 One year CISM programme in Drilling Engineering.
- 5 Three year part-time M. Tech. Course in mining Machinery.

For the consolidation of the existing activities and the introduction of the new Programmes, the Committee recommends the following for this Department :—

Professor : 2 (one for drilling engineering and one with extensive background in mining machine)

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Assistant Professors	: 3
Lecturers	: 5
Sr. Research Fellowships	: 2
Jr. Research Fellowships	: 2
Tech. Asstt, (Draughtsman)	: 1
Equipment	: 6.00 lakhs
Research Contingencies	: 15,000 per annum
Additional space	: 15,000 sq ft.

DEPARTMENT OF CHEMISTRY FUELS AND METALLURGY

The Department offers instructions in Chemistry, fuel technology, assaying metallurgy and mineral dressing. Students of all disciplines attend the courses in the Department upto second year level; and 3rd year (mining and petroleum technology), 4th year (mining Geology and petroleum technology) and 5th year. Mining Students also attend courses offered by the Department. The Department is also carrying on active research work and research papers relating to ceramic raw materials, self-glazed cordierite bodies, durability of Soda Lime silicate glass and other important topics have been published in journals of repute. The Department is now registering students for PhD. A short-term courses on "coal preparation and washery techniques" was organised by the Department in 1975 in collaboration with other organisations. Participants included mechanical and mining engineers sponsored by the mining industry. The Department has one Professor, one Asstt Professor, 7 Lecturers, 4 Instructors and supporting staff on its strength.

The Committee considered the proposals for new courses and felt that the School may start the DISM/M Tech, course in fuel technology, in the V Plan if sponsored by a user organisation; otherwise this may be considered in the VI Plan period. Meanwhile the School may develop an infra structure for R&D, if it so wishes from its present resources. The Committee, however, recommended the station of a postgraduate course in mineral preparation and recommended the following additional facilities for the new course as well as for the consolidation and strengthening of teaching and research already undertaken.

Professor	: 1	(Coal preparation and (mineral preparation)
Asstt Professor	: 1	

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Asstt Professor	: 1 (Chemistry)
Senior Research Fellowships	: 1
Jr. Research Fellowship	: 2
Equipment	: Rs. 3.00 lakhs (Rs. 2.00 lakhs for mineral preparations and Rs. 1.00 lakh for Chemistry and Fuels)
Research Contingencies	: Rs. 20,000 per annum
Additional space	: 1,000 sq ft.

DEPARTMENT OF PHYSICS AND MATHEMATICS

This Department provides instructions in basic physics and mathematics including electronics to the students of different departments of the School. The department has at present one Professor, 2 Assistant Professors, 7 Lecturers, one Instructor and a Scientific Assistant. Apart from providing instructions, some research work is also being done by the faculty and they are stated to have contributed 15 research papers in Indian and foreign papers during the past five years. The facilities for routine student work in the Department appear to be adequate. However, facilities for undertaking PhD work do not appear to have developed properly. Even research work that is being carried on is not of very high grade, although existing faculty members could possibly undertake higher level research work if proper encouragement is provided. The Committee felt that the department while providing basic structure in physics and mathematics for the entire School should play a leading role in undertaking research problems of the mining industry where mathematics, physics and electronics are required. At present no such work is done and even research that is being conducted is mostly towards pure problems not connected with mining industry. The department should take up common inter-departmental collaborative programmes specially with Geophysics and Mining Engineering.

The inter-departmental collaboration between this department and others seems at a very low level. This also applies to some extent to the inter-departmental collaboration between different departments on the whole and needs to be looked into.

The thrust area of the electronics division of this department should be in the direction of development of electronic gadgets useful in

exploration and exploitation of mineral resources. This division, therefore, needs strengthening both in personnel and in equipment. On the whole, the department seem to be rather poorly handled and at present occupies a secondary position. With this and all-pervading atmosphere of undergraduate orientation, this department suffers greatly. It would be in the interest of the School to encourage this department to play an equal and efficient role as other departments in the development of the Institution.

For the consolidation and strengthening of the existing activities of the department, the Committee recommends the following additional facilities :—

Professors	: 2 (one in mathematics and the other in electronics)
Sr. Research Fellowships	: 1
Jr. Research Fellowships	: 2
Research contingencies	: Rs. 20.000 per annum.
Equipment	: Rs. 5.00 lakhs

DEPARTMENT OF LANGUAGES & HUMANITIES

The department of languages was started in 1926 to teach english and some foreign languages viz., German, french to students of the School with the help of one lecturer only. Subsequently in fithees, the department started teaching history, economics, civics etc. to the students so as to provide them some idea of social, economic and political environment in which the students will have to apply their professional skills after the completion of their courses. The Department does not offer any independent course of its own. During the first three years all subjects taught by the department are compulsory and the students have to pass in these subjects like scinee or technical subjects. In the 4th & 5th year of the integrated course, the humanities subjects are not treated at par with other subjects like Geology, Mining etc., and are allotted only sessional marks.

The department has one Asstt. Professor and two Lecturers on its staff. In addition, the department is also assisted by two part-time teachers-one in Economies and the other in english. The Committee

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recommends the following for strengthening the existing activities of the Department :—

Lecturer	: One (preferably in Russian with knowledge of polish language).
Lib. Assistant	: One
Equipment	: Rs. 1.60 lakhs
Addl. space	: 1,000 sq. ft.

EXECUTIVE DEVELOPMENT CENTRE

The School has proposed the establishment of the following two faculties :—

- 1 Faculty of Management and Industrial engineering.
- 2 Faculty of Continuing Education.

With regard to the former, it was pointed out to the Committee that the Indian mining industry has lagged considerably behind other industries in the application of modern management concepts and techniques. If the industry is to meet the challenges of the time, it must regularly expose its executives to management training in different areas of relevance. Therefore, the faculty of management and industrial engineering would be necessary for developing management training programmes especially oriented towards the needs of mineral industries.

The Committee feels that though the School may not have a full fledged Faculty of Management there is need for the School offering certain courses in Management as applied to mining Industry. The School may organise short term courses in Industrial Engineering, Industrial Finance, Personnel Management etc. as applied to Mining Industry with the help of specialist organisations in Management. For this purpose the Committee recommends the following :—

Professor	1
Asstt. Professor	1

With regard to the proposal for a full fledged faculty for continuing education, the Committee was informed that one of the major needs of the mining industry today is the provision of facilities for continuing education in functional areas for inservice employees. There is need for short-term courses in different areas. A considerable effort has already

been made by the School in organising short-term refresher courses, However, in order to coordinate and develop this activity, a separate faculty of continuing education, which will also encampass a cell for management of education, would be necessary. In view of the importance of this work, the Committee recommends one Professor for Continuing Education (This has already been sanctioned by the Commission outside the 5th Plan and hence its financial implications are not being included in this report).

CENTRAL WORKSHOP

The Contral Workshop was originally designed to service the School campus in additton to providing instructions in workshop practices to the first year students. With the increase in the research activities of the School, it was subsequently called upon to help fabricate research equipments. At present, the workshop also looks after the maintenance of the School vehicles and the internal PAX telephone exchange. The workshop has on its staff a Workshop Superintendent, who is a mechanical engineering graduate. He is assisted by a foreman instructor and an asstt. foremen instructor a senior tecnical assistant and a technical assistant. The Committee recommends the following additional staff and facilities for the efficient working of the Workshop :—

Asstt. Workshop

Superintendent	: 1 (in the scale of Rs. 700-1300)
Foreman Instructors	: 2 (one Mechanical & one Electrical).

Sr. Tech. Assistant	: 1
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Tech. Assistant	: 1
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Electricians/Mechanics	: 4
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Equipment	: Rs. 3.00 lakhs
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Workshop Building including shed for the vehicles	: Rs. 5.00 lakhs
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CENTRAL INSTRUMENT SERVICE CENTRE

The Central Instrument Service Section was started in 4th Plan on the recommendation of the UGC. It has one asstt. professor (electronic) and two mechanics. All the School departments use a number of electronic, optical and other instruments which need frequent repairs. With the expansion in the teaching and research activities of the School, the need for instruments repair facilities has gone up and will go up further. Keeping this in view, the Committee recommends the following for this Centre :—

Electronics Engineer

(in the Lecturer's scale) : 1

Sr. Tech. Assistant : 2

Glass blower : 1

Equipment : 1.15 lakhs

Addl. space : 1,000 sq.ft.

The Committee further recommends that all electronics staff (including project Officer in petroleum technology department and the technicians in applied geophysics department) and all electronics equipment maintenance should be concentrated in the Central Instrument Service Centre in order to provide efficient repair facilities.

EDP FACILITIES

The Committee was informed that the School is the premier institution engaged in training graduate and postgraduate personnel for the fast-growing mineral industries. During the 5th Plan, the School proposes to embark upon additional programmes both in teaching and research. Computer exposure to undergraduates would start and the various NCST panels have identified the School as one of the Centres for establishing and carrying out R&D activities in areas relevant to mineral industries. These justify amply the setting up of a proper electronic data processing Centre at ISM Dhanbad. A suitable computer could in due course be obtained from the School as a gift/aid under one of the aid programmes. However, some card punching machines and a few technical hands should be provided immediately. The Committee recommends the following :—

Punch Operator : 1

Equipment : Rs. 1.00 lakhs

LIBRARY

The Library is now housed in a new building the rear part of the administrative block and has a working space of about 650 sq. metres. The planning of the building does not seem to be satisfactory for a functional library. The ground floor rooms are dark and need more light.

The total number of books in the library is about 40,000 and the School contributes to nearly 300 journals. The library works from 8.00 A. M. to 9.00 P. M. and has about 500 reading seats. The average number of books is between 300 and 400. Due to shortage of staff, it has not been possible for the library to undertake annual physical verification of books. The average loss of books is stated to be about 3-4 per thousand. The School spends about Rs. 50,000 annually on the purchase of books and journals from its normal budget. The library has started a book bank with UGC assistance since February 1974. Books are issued to students on a long term loan basis.

The Library has lot of arrear work with regard to the classification, cataloguing and mechanical treatment of books. The School proposes to clear the arrear work with the help of temporary technical hands. The School has at present a Librarian (in the Dy. Librarian scale) and one Library Assistant. The School has already produced reprographic machine but no technical hand to operate it. Taking all relevant factors into consideration the Committee recommends the following to enable the Library to provide efficient library services to the staff and students :—

Asstt. Librarian	: 1
Professional Assistant	: 2
Technical Assistant	: 1
(Reprography)	
Cataloguer	: 1
Library Asstts.	: 3
Library Attendant	: 1
Books	: Rs. 6.00 lakhs
Furniture	: Rs. 1.00 lakhs
Provision for clearing arrears work.	: Rs. 1.00 lakhs



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GENERAL

The Committee note that the Commission had already approved the construction of a 200 seated hostel in the School. The Committee was convinced that there is need for further residential accommodation for the students and recommended that another hostel to accommodate 100 students may be provided. If there is still need for additional hostel accommodation and funds permit, the Commission may sanction additional residential accommodation for students. The Committee also recommended the following :-

Health Centre	— Rs. 5.0 lakhs
Gymnasium	— Rs. 3.0 lakhs
Open Air Stadium	— Rs. 0-70 lakhs
Swimming Pool	— Rs. 5.0 lakhs (token provision)
Renovation/alterations of existing hostels	— Rs. 3.0 lakhs

The Committee noted that the Commission had agreed to the School constructing a Guest House and had released an amount of Rs. 1.0 Lakh for that purpose. However, the School has not been able to construct the building so far. There is an urgent need for the School to have a Guest House and this need would become all the more urgent in view of the increasing demand on the School facilities as a result of additional teaching and research activities. The Committee recommends that an amount of Rs. 5.0 lakhs may be provided for the Guest House. This amount is being provided keeping in view the fact that the School may have to provide accommodation to Guest lecturers and foreigners who visit the School for short-term course and under international collaboration programmes.

The Committee recommends a lump provision of Rs. 60 lakhs for providing residential accommodation to the staff (both teaching and non-teaching) of the School according to the norms laid down by the Commission. This allocation may also be utilised (not more than 15%) for renovation of the existing staff quarters which needed immediate repairs.

The Committee is not making any recommendations with regard to the campus development schemes put forth by the School (water supply, electricity, roads etc) as also for the additional administrative staff. The Commission may examine these separately.

The Committee has the following general recommendations to make for the development of the Indian School of Mines, Dhanbad :—

- 1 Basic science departments like Physics, Chemistry and Mathematics appear to suffer from an inferiority complex and measures both academic and organisational should be taken to remove this feeling so that they feel themselves as much and as important a part of the school as any other main department.
- 2 To give proper importance to the subsidiary science and humanities departments, the students final grade should contain some percentage of marks obtained in these papers. There should also be annual university examinations in these subjects, in the absence of which the students do not take these subject seriously.
- 3 The research by the faculty in the supporting departments should have some relation to the main work of the School. The departments should interact on inter-disciplinary research.
- 4 The School should not go too much into Chemical technology oriented courses but concentrate on specialised topics related to exploration and exploitation of mineral deposits.
- 5 The UGC may look into the question of participation of teachers and students on the bodies of the School in the light of the recommendations of the Gajendra Gaedkar Committee on governance of universities.
- 6 The School should look into the general grievances of the students and teachers especially the question of allowance to be paid to the students when they are sent out on practical training. May be the School could procure some stipends from the industry concerned for the students deputed for training.
- 7 The UGC may consider the question of the heavy liability on account of the recurring component of the recommendations of the committee after the 5th Plan period when this expenditure would become a committed liability to be borne by the UGC which is providing maintenance grant to the School.
- 8 The Indian School of Mines Dhanbad should have close collaboration with Central Mining Research Station, Central Fuel Research Institute, Bharat Coking Coal Ltd. and the Directorate General of Mines Safety. These institutions are located close to the School and have lot of resources in the form of expertise and equipment which would bring in an amalgam of theory and practice so badly needed in addition to latter institution of resources.

A statement indicating the financial implications of the recommendations of the visiting Committee is attached (Annexure-II)

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ANNEXURE - I

INDIAN SCHOOL OF MINES
DHANBAD

STUDENT POPULATION - 1975 - 76

Year	Mining	P. Tech.	App. Geol.	App. Geophy	Total
I Year	63	16	18	18	115
II Year	67	12	7	2	88
III Year	44	7	12	7	70
IV Year	31	9	8	10	58
V Year	36	11	9	8	64
	241	55	54	45	395

Total undergraduate : 395(A)

1 Year DISM 50

2 year M. Tech. (Mining)
(Industry oriented) - 10

2 Year M. Tech. (open cast) - 12

Research Scholars - 26

ISM Research Scholars - 19

Total Postgraduate 117

Grand Total - 512 (A+B)

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ANNEXURE - II

		Rs. in lakhs
A.	Liability of IV Plan allocation in respect of Books & Equipment	7.42
B.	Commitments made before the report of the Visiting Committee	
	i) Mineral Dressing Lab. Building	11.13
	ii) Science Block (14500 sq. ft.)	21.70
	iii) Hostel for 200 students	33.17
		Total : 66.00
C.	Financial implications of the recommendations of the Visiting Committee for the period of 1976-77 to 1980-81.	
		Total cost for 5 years
		<u>Rs. in lakhs</u>
i)	Department of Mining :	
	Professors 3	3.45
	Asstt. Professors 3	2.85
	Lecturers 5	3.25
	Sr. Research Fellow 1	0.46
	Jr. Research Fellow 2	0.70
	Res. Contingencies Rs. 50,000/- p. a.	2.50
	Equipment	9.00
	Addl. Space Rs. 15000 sq. ft.	22.50
	Development of an experimental mine cum-mining museum } Rs. 2.50 lakhs	2.50
		47.21
ii)	Department of Petroleum Technology	
	Sr. Research Fellowship 1	0.46
	Jr. Research Fellowship 2	0.70
	Equipment	2.75
	Addl. Space 2500 sq. ft.	3.75
	Research contingencies Rs. 10,000/- p. a.	0.50
		8.16

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iii) Department of Applied Geology :

Professor	1	1.15
Asstt. Professor	2	1.90
Sr. Research Fellowship	2	0.92
Jr. Research Fellowship	4	1.40
Sr. Research Assistant	1	0.50
(Genl. Chemistry)		
Section Cutter (Sr. Grade)	1	0.50
Technical Assistant	1	0.40
(Museum Assistant)		
Research Contingencies	Rs. 10,000 p. a.	0.50
Field work	Rs. 15,000 p. a.	0.75
Equipment	—	4.00
Addl. Space	5000 sq. ft.	7.50
		19.52

iv) Department of Applied Geophysics :

Professor	1	1.15
Lecturer	1	0.65
Sr. Research Fellowship	1	0.46
Jr. Research Fellowship	2	0.70
Research Contingencies	Rs. 20,000 p. a.	1.00
Equipment		5.00
Addl. Space	1000 sq. ft.	1.50
		10.46

v) Department of Engineering Mining Machinery

Professors	2	2.30
Asstt. Professors	3	2.85
Lecturers	5	3.25
Sr. Research Fellowship	2	0.92
Jr. Research Fellowship	2	0.70
Tech. Assistant (Draftsman)	1	0.40
Equipment		6.00
Research contingencies	Rs. 15000 p. a.	0.75
Addl. Space	15000 sq. ft.	22.50
		39.67

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vi) **Department of Chemistry Fuels & Metallurgy**

Professor	1	1.15
Asstt. Professors	2	1.90
Sr. Research Fellowship	1	0.46
Jr. Research Fellowship	2	0.70
Equipment		3.00
Research contingencies	Rs. 20,000/-p. a.	1.00
Addl. Space	1000 sq. ft.	1.50
		9.46

vii) **Department of Physics & Mathematics :**

Professors	2	2.30
Sr. Research Fellowships	1	0.46
Jr. Research Fellowships	2	0.70
Research contingencies	Rs. 20,000/-p. a.	1.00
Equipment		5.00
		9.46

viii) **Department of Languages & Humanities :**

Lecturer	1	0.65
Library Asstt.	1	0.40
Equipment		1.60
Addl. Space	1000 sq. ft.	1.50
		4.15

ix) **Executive Development Centre :**

Professor	1	1.15
Asstt. Professor	1	0.95
		2.10

x) **Central Workshop :**

Asstt. Workshop Supdt.	1	0.65
Foreman Instructors	2	1.00
Sr. Tech. Assistant	1	0.50
Technical Assistant	1	0.40
Electrician/Mechanics	4	1.20
Equipment		3.00
Workshop Building (including shed for the vehicles).		5.00
		11.75

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xi) **Central Instruments Service Centre :**

Electronics Engineer	1	0.65
(in the Lecturer's scale)		
Sr. Tech. Asstt.	1	0.50
Glass Blower	1	0.30
Equipment		1.15
Addl. Space	1000sq. ft.	1.50
		4.10

xii) **EDP facilities :**

Punch Operator	1	0.30
Equipment	Rs	1.00
		1.30

xiii) **Library :**

Asstt. Librarian	1	0.65
Professional Asstt.	1	0.50
Tech. Asstt. (Reprography)	1	0.40
Cataloger	1	0.40
Library Asstt.	2	0.80
Library Attendant	11	0.25
Books		6.00
Furniture		1.00
Provision for clearing arrear		
Work		1.00
		11.00

xiv) **General :**

i) Hostel for 100 students	17.00
ii) Health Centre	5.00
iii) Gymnasium	3.00
iv) Open air Stadium	0.70
v) Swimming Pool (token provision)	5.00
vi) Renovation/alteration of existing hostel	3.00
vii) Guest House	5.00
viii) Residential accommodation to staff	60.00
(Both teaching and non-teaching)	
	98.70

Total : 277.29

GRAND TOTAL (A+B+C) :—350.71 or
say 351.00

ANNEXURE - III

BUILDING AND EQUIPMENT

S. No.	Department	Buildings	Equipment
		Rs.	in lakhs
1	mining	25.00	9.00
2	Petroleum Tech.	3.75	2.75
3	Applied Geology	7.50	4.00
4	Applied Geophysics	1.50	5.00
5	Engg. & Mining Machinery	22.50	6.00
6	Chemistry	1.50	3.00
7	Physies & Mathematics	—	5.00
8	Languages & Humanities	1.50	1.60
9	Central Workshop	5.00	3.00
10	C. I. S. Centre	1.50	1.15
11	E. D. P. Facilities	—	1.00
12	<u>General</u>		
i)	Hostel	17.00	—
ii)	Health Centre	5.00	
iii)	Gymanasium	3.00	
iv)	Stadium	0.70	
v)	Swimming Pool	5.00	
vi)	Renovation/Alteration of existing hostel	3.00	
vii)	Guest House	5.00	
viii)	Staff Quarters	60.00	
Total		<u>168.45</u>	<u>41.50</u>

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INDIAN SCHOOL OF MINES DHANBAD

Schemes accepted by the U. G. C. for V Plan period.

A. Non-Recurring

<u>S. No.</u>	<u>Item</u>	<u>Amount approved</u> Rs. in lakhs
1	Liability of the IV Plan (Books & Equipment)	7.42
2	Commitments made before the report of the Visiting Committee (Buildings)	66.00
3	Books, Furniture etc. for the Library,	8.00
4	Equipment	41.50
5	Building	168.45

B. Recurring

1	Staff	11 Professors, 11 Asstt. Professors 12 Lecturers and 25 other posts. SRF-9, JRF-16
2	Fellowships	
3	Research contin- gencies.	Rs. 4.80 (for three years)

N.B. :—Details are given in Annexures I to III.



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ANNEXURE-I

STAFF APPROVED DURING V PLAN PERIOD

S. No.	Department	Posts	Specialisation
1	Mining	3P	One each in mine system design, open - cast and mine survey.
2	Applied Geology	1P 2AP 1 SRA 1 Section Cutter 1 T. A.	Egg. Geology One each for ore and Coal Geology
3	Applied Geophysics	1P 1L	
4	Engg. and Mining	2P 3AP 5L 1T.A.	One each for drilling Engg. and Mining Machine.
5	Chemistry Fuels & Metallurgy	1P 2A.P.	Coal Preparation One each in mineral preparation and Chemistry.
6	Physics & Maths	2P	One each in Maths. and Electronics.
7	Languages & Humanities	1L 1Lib. Asstt.	
8	Executive Dev. Centre	1P 1A.P.	

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S. No.	Department	Posts	Specialisation
9	Central Workshop	1 Asstt. Workshop Supdt. 2 Foreman Instructors 1 S. T. A. 1 T. A. 4 Electricians/ Mechanics.	
10	C. I. S. C.	11 Electronics Engineer 1 S. T. A. 1 Glass Blower	
11	E. D. P. Facilities	1 Punch Operator	
12	Library	1 Asstt. Librarian 1 Prof. Asstt. 1 T. A. (Reprography) 1 Cataloger 2 Lib. Assistants 1 Lib. Attendant	

ANNEXURE - II

FELLOWSHIPS & RESEARCH CONTINGENCIES

S. No.	Department	Fellowships		Research Contingencies (including field work) for three years.
		SRF	JRF	
				Rs. in lakhs
1	mining	1	2	1.50
2	Petroleum Tech.	1	2	0.30
3	Applied Geology	2	4	0.75
4	Applied Geophysics	1	2	0.60
5	Engg. & Mining Machinery	2	2	0.45
6	Chemistry-Fuels & Metallurgy	1	2	0.60
7	Physies & Mathematics	1	2	0.60
		9	16	4.80



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ANNEXURE II(A)

**Number of candidates who passed the Degree/Post-graduate
Examinations during 1976-77**

Faculty/ Department	Degree/ Diploma	Number passed	
		Undergraduate	Postgraduate
Applied Geology	B Sc (Hons)	12	—
	M Sc	9	—
	M Sc Tech	—	10**
	PhD	—	1
Applied Geophysics	B Sc	3	—
	M Sc	8	—
	M Sc Tech	—	4
	PhD	—	2
Chemistry	DISM		
	(Coal/Min Prep)	—	6
	PhD	—	2
Mining Engg	B Tech	37	—
	M Tech	—	5**
Mining Machinery*		—	45
Petroleum Engg	B Tech	11	—
	M Tech		
	(By Research)	—	1
Total :		80	76

* Successfully completed the one-year industry-oriented postgraduate programme in Coal Mining Machinery supported by Bharat Coking Coal Limited-not awarded any academic certificate, as per desire of B C C L.

** Results not yet declared.

ANNEXURE II(B)

List of RESEARCH Degrees awarded by
INDIAN SCHOOL OF MINES

Name of Awardee	Date of Award	Subject	Guide
PhD			
1 Shrish	24. 3.69	Geology	SN Sarkar
2 S M Dutta	17. 6.69	Geology	SN Sarkar
3 K K Chatterjee	29.12.69	Geology	D Chandra
4 M S Bhalla*	12. 9.71	Geophysics	J Singh
5 A K Sen	15. 7.72	Geophysics	J Singh
6 B K Rastogi*	18. 9.72	Geophysics	RK Verma/ J Singh
7 S C Garde*	21. 6.73	Geophysics	J Singh
8 K L Rai	21. 3.74	Geology	RT Shukla
9 A Basu	28. 3.74	Geology	SN Sarkar
10 S N Prasad	28. 3.74	Geophysics	J Singh
11 S S Mital*	22. 8.74	Geophysics	RK Verma
12 V K Singh	5. 3.75	Geology	OP Verma
13 B N P Agarwal	30. 4.75	Geophysics	RK Verma
14 U P Gupta	5. 8.75	Geology	D Chandra
15 P K Panda*	8.11.75	Geophysics	RK Verma
16 Deobrata Ghosh	9. 3.76	Geophysics	J Singh
17 M Mukhopadhyay	9. 3.76	Geophysics	RK Verma
18 M Prakash	16.10.76	Geology	SN Rai
19 K Mallick*	24.11.76	Geophysics	RK Varma
20 S Mukherjee	24.11.76	Chemistry	NS Rawat
21 B N Satpathy*	17. 6.77	Geophysics	RK Verma
22 A S Rao	27. 6.77	Chemistry	D Lahiri/ PK Gango- padhyay
23 R S Singh	7. 7.77	Geophysics	J Singh
24 B Banerjee*	7. 7.77	Geology	KL Rai
M Sc/M Tech			
1 A N Gupta	13. 6.79	Min Engg	RD Singh
2 A K Jha	17. 6.69	Min Engg	RD Singh
3 Deobrat Singh*	16. 6.72	Min Engg	RD Singh
4 B K Mazumdar	4. 9.74	Min Engg	RD Singh
5 Sunil Kumar	25. 3.77	Pet Engg	SK Baijal

* External Candidates.

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ANNEXURE - III (A)

Academic calender for III, IV & V YEARS

Session began for II/III Yr IV/V Yr	28.6.1976 12.7.76
Class Tests : III-V yrs	13.9.76 to 18.9.76
Puja Vacations	20.9.1976 to 18.9.1976 (Plus Puja holidays)
Mid-Sessional Exams. for III-Min-Pet and Class Tests for III-AG-AGP/IV-V yrs	25.10.1976 to 30.10.1976
Class Tests : III-V yrs.	13.12.1976 to 18.12.1976
Winter Break/Vacation (3-weeks)	20.12.1976 to 8-1.1976
Annual Sports	11/12.2.1977
Completion of courses	12-3-1977
Classes ended on	26.3.1977
Examinations started on	4.4.1977
Examination ended	
III/Min-Pet	30.4.1977
III/AG-AGP	
IV/V All disciplines	7.5.1977
V Yr Project Reports (Min/AG/GP)	28.5.1977
Computer Programme for V Yr Min/AG/GP	30.5.1977 to 4.6.1977
Summer vacation (10-11 Weeks)	2/9.5.1977 to 16.7.1977
Next Session expected to be commence from	18.7.1977

ANNEXURE III(B)

Academic Calender for Undergraduate Semester System

Session began on	12.7.1976
Puja Vacations	20.9.76 to 27.9.76 (Plus Puja Holidays)
Preparation Time and Practical Examinations	6.12.1976 to 11.12.1976
I Semester Examination	13.12.1976 to 18.12.1976
Winter Brcak/Vacations (2 weeks)	20.12.1976 to 2.1.1977
Annual Sports	11/12.2.1977
Preparation time and Practical Examinations	2.5.1977 to 7.5.1977
II Semester Examination	9.5.1977 to 14.5.1977
Preparation time for I Semester Examination for failed students	16.5.1977 to 21.5.1977
I Semester Examination for failed students	23.5.1977 to 28.5.1977
Vacations (9 Weeks)	15.5.1977 to 16.7.1977



ANNEXURE IV

LIST OF RESEARCH SCHOLARS

Senior Research Fellows/Scholars

Sl. No.	Name	Title of Project
1	B Rameshwar	Indigenous additives for oilfield drilling fluids and contents
2	J R Murthy	Model oilwell drilling fluid system with indigenous additives

Junior Research Fellows/Scholars

1	P K Roy (Gph)	Magnetic survey and mining exploration
2	Srikumar Mukherjee (Chem)	Study of metal complexes in solutions
3	S K Addy (Math)	Effect of internal stress on Rhilological materials
4	T K Bandopadhyay (Gph)	Gravity studies
5	D K Sen (Math)	Studies in Binding Energy and excitation states of odd and even A Nucleii (and applications of nonlocality of nuclear forces)
6	K V V S Gautam (Geol)	Structure stratigraphy & Petrology of the Sausar group rocks of karmurs site Kisu area
7	A U S Sarma (Gph)	Gravity studies in Eastern India
8	N C Bhuin (Gph)	Resistivity surveys in ground water aroun Dhanbad
9	A K Nag (Gph)	Gravity surveys In Northern Bihar
10	Sasadhar Sahu(Gol) (Left in March, 1976)	Structural stratigraphic and geochemical investigation of section group rocks with special reference to ore & deposits in certain parts of M P, Maharastra structure of patrology of Bihar mica belts (Khalisa areas)

Sl. No.	Name	Title of Project
11	Anil Kishore (Emm)	Dynamic breaking of induction meters for mining applications
12	N R Bhattacharjee (Pet)	Exploration of the Kalyadi copper belt in Karnataka
13	Shri G Konar (Geol)	Scheme on structural and stratigraphic and geo-chemical investigation of the sausar group rocks with special reference to manganese ore deposits in certain parts of M P and Maharastra
14	Aloke Kr. Bhanja (Gph)	Magnetic survey in Eastern Himalayas
15	Tapan Kr Bose (Gph)	Model and field studies of multi-frequency electromagnetic response of geological conductors
16	N B Chanda (Geol)	Stratigraphy and structure of the precambrian mineralised belts
17	Nabin Ch. Bhatia (Elec)	Insulation monitoring & earth leakage projection scheme for under ground mines
18	S Bandopadhyay (Chem)	Interaction of two coloring oxides in low melting glasses.
19	R K Gupta (Chem)	Study of mine water corrosion and its prevention activation of coke
20	Sajal Das (Fuel)	Activation of coke
21	P C paul (Math)	Theoritical study of the propagation of elastic waves in layered media
22	M P Verma (Phy)	Spectroscopic studies of some molecules
23	A K Sinha (Geol)	Polymetallic sulphide deposits of Ambamatia-devi belt

Sl. No.	Name	Title of the Project
24	V K Jain (Geol)	Geological investigation of sukunda ultramafic belt
25	R K Choudhuray (Min)	Assessment of surface movement due to mineral extraction
26	B K Choudhury (Geol)	Structure and stratigraphy of Goan area of the Bihar mica belt
27	K K Nath (Gph)	Ground water project
28	Md Alam (Geol)	Petrography structure and prevalence of lower gandewana rocks in Jharia coalfield
29	S K Hazra (Pet)	Study of the paraffin depositon in oil-wells and surface pipes
30	B K Panda (Phys)	Absorption studies of some minerals and opticals and infra red spectral region
31	S M Chatterjee (Phys)	Investigations on and effect radiation in materials
32	P Mohan (Chem)	Study of corrosion inhibitors in acid mine water
33	G Johri (Chem)	Spectrophotometric studies of second row transition metal complexes of solution
34	A K Agarwal (Geol)	Investigation of rare earth in carbonates at Ambasdenagar Gujrat
35	C Natarajan (Geol)	Sulphide mineralisation in southern part of Sikkim

Foreign Scholar

1	Md H Ashraf (Gph)	Gravity surveys in Rajmahal volcanoes
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ANNEXURE-V

COMPOSITION OF ISS EXECUTIVE COMMITTEE

1976-77

Class Representatives	D K Ghosh	V Min
	H K Sharma	IV Pet
	Rajib Singh	III Min
	E C Reji	II Pet
	T K Mandal	I Min
Student representatives from Faculty Societies	Ajay Dhar	V Min
	K Bora	V Pet
	Mohd Imaran	V Geol
	A K Chatterjee	V Gph
Representative of academically outstanding students	Atul Arya	IV Pet
Representative of PG students/Research Scholars	A K Sen	RS (Min)
Representative of sportsmen	N K Bharali	IV Pet
Representative of students active in the management of cultural and social activities	Atanu Mukherjee	IV Pet
Hostel Profects	R K Nagpal	V Min
	Ashok Sarkar	V Min

President	: D K Ghose	V Min
Vlce-President	: Ajay Dhar	V Min
Secretary	: H K Sharma	IV Pet
Jt. Secretary	: Atanu Mukherjee	IV Pet



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ANNEXURE VI(A)

LIST OF MEMBERS OF GENERAL COUNCIL AS ON
JUNE 30, 1977

- | | |
|---|---|
| <p>1 Shri J G Kumarmangalam
Managing Director
M/s Bird & Co Limited
Chartered Bank Building
Calcutta-1
(Chairman)</p> | <p>8 Dr Hari Narain
Director
National Geophysical
Research Institute
Hyderabad-500007</p> |
| <p>2 Shri P K Ghosh, M P
Lok Sabha
28 Gurdwara
Rakabganj Road
New Delhi-110001
(upto 23.3.77)</p> | <p>9 Dr G Ramaswamy
Adviser (Exploration)
Oil & Natural Gas Commission
Bank of Baroda Building
Parliament Street
New Delhi-110001</p> |
| <p>3 Shri Ramavarat Shahstri, M P
Lok Sabha
208 North Avenue
New Delhi-110001
(upto 23.3.77)</p> | <p>10 Dr U Aswathanarayana
Professor of Geology
University of Saugar
Sagar-470003</p> |
| <p>4 Shri Kameshwer Singh. M P
Rajya Sabha
P O Shakrpura
Begu Sarai
Distt Monghyr</p> | <p>11 Shri S Bagchi
Director
Central Mining Research
Station
Dhanbad.</p> |
| <p>5 Padmashri S K Nargundkar,
Consultant, F C I Limited
10-5-35, Masab Tank
Hyderabad-500028</p> | <p>12 Shri S D Prasad
Directorate General of Mines
Safety
Dhanbad</p> |
| <p>6 Dr A G Jhingran
Director, wadia Institute of
Himalayan Geology
Delhi University,
Delhi</p> | <p>13 Shri V K S Vardan
Director General
Geological Survey of India
27 Jawaharlal Nehru Road
Calcutta-13</p> |
| <p>7 Shri B L Varma
E-I/68, Arena Colony
Bhopal (M P)</p> | <p>14 Shri S N Talukdar
Director, Instt of Petroleum
Exploration
Oil & Natural Gas Commission
Kaulagarh Road, Dehradun</p> |

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- | | |
|--|---|
| <p>15 Shri M R Kamra
Director (Production)
National Mineral Development
Corporation,
Mukarramjahi Road,
Hyderabad - 500001</p> <p>16 Shri J M Dhawan
Chief Mining Engineer
Central Coalfields Limited
Darbhanga House,
Ranchi - 834001</p> <p>17 Shri Madan Lal Agarwala
President
Indian Colliery Owners'
Association
Jharia (Dhanbad)</p> <p>18 Shri R T Desmukh, Director
Directorate of Practical
Training in Mining
P O : I S M
Dhanbad</p> <p>19 Shri P K Chatterjee
President
Geological Mining and
Metallurgical Society of India
59 Khelat Babu Lane
Calcutta - 2</p> <p>20 Shri G C Singh Roy
Shaw Wallace & Co Limited
4 Bankshall Street
P B No 70
Cancutta - 700001</p> | <p>21 Shri R N P Sinha
Dy Financial Adviser
Ministry of Finance
(Education Unit) New Delhi</p> <p>22 Shri S Vedanthan
Dy Educational Adviser
Ministry of Education & S W
Deptt of Education
New Delhi.</p> <p>23 Commissioner
Coal Mines Welfare
Organisation
Jagjivan Nagar
Dhanbad</p> <p>24 Prof G S Marwaha
Director
Indian School of Mines</p> <p>25 Prof R D Singh
Head, Deptt of Min Engg
Indian School of Mines</p> <p>26 Prof S N Sarkar
Head, Deptt of App Geology
Indian School of Mines</p> <p>27 Prof S Srini-Vasan
Head, Deptt of Pet Engg
Indian School of Mines</p> <p>28 Prof S K Bordia
Registrar
(Secretary)</p> |
|--|---|



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ANNEXURE - VI(B)

LIST OF MEMBERS OF EXECUTIVE BOARD
AS ON JUNE 30, 1977

- | | |
|---|---|
| 1 Shri J G Kumarmangalam
Managing Director M/s Bird
& Co Limited Chartered Bank
Building
Calcutta-1
(Chairman) | 7 Dr G Ramaswamy
Adviser (Exploration)
Oil & Natural Gas Commission
Bank of Baroda Building
Parliament Street
New Delhi-110001 |
| 2 Dr U Aswathanarayana
Professor of Geology
University of Saugar
Saugar-470003 | 8 Shri R N Sharma
Managing Director/Chairman
Bharat Coking Coal Limited
Bhuggatdih Buildings
P O Jharia
Dhanbad |
| 3 Shri S Bagchi
Director,
Central Mining Research
Station
Dhanbad | 9 Shri R N P Sinha,
Dy Financial Adviser
Ministry of Finance
(Education Unit)
New Delhi. |
| 4 Dr Hari Narain
Director
National Geophysical
Research Institute
Hyderabad-500007 | 10 Shri S Vedantham
Dy Educational Adviser
Ministry of Education and S.W
Deptt of Education
New Delhi |
| 5 Padmashri S K Nargundkar
Consultant, F C I Limited
10-5-35 Masab Tank
Hyderabad-500028 | 11 Prof G S Marwaha
Director
Indian School of Mines |
| 6 Shri S D Prasad
Directorate General of Mines
Safety
Dhanbad. | 12 Prof S K Bordia
Registrar
(Secretary) |



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ANNEXURE VII(A)

**LIST OF MEMBERS OF ACADEMIC COUNCIL/ISM
AS ON JUNE 30, 1977**

- | | |
|--|---|
| 1 Prof G S Marwaha
Director
(Chairman) | 10 Prof S N Mitra,
Head, Deptt of Physics and
Mathematics |
| 2 Shri V K S Vardan
Director General
Geological Survey of India
27, Jawaharlal Nehru Road,
Calcutta. | 11 Prof K R M Rao
Head, Deptt of Engg and
Min Machinery |
| 3 Dr M G Krishna
Director
Central Fuel Research Institute
P O : Jealgore
Distt Dhanbad. | 12 Prof D K Sinha
Head, Deptt of Industrial Engg
and Management |
| 4 Prof B S Verma
Head, Deptt of Mining
Institute of Technology,
Banaras Hindu University,
Varanasi-5. | 13 Prof T C Rao
Head, Deptt of Chem Fuel &
Metallurgy |
| 5 Shri K S Ghosh
Addl Chief Engineer (E & M)
Bharat Coking Coal Limited
Bhuggatdih Buildings
P O : Jharia. | 14 Shri D P Jha
Head, Deptt of Humanities
and Social Sciences |
| 6 Prof S N Sarkar
Head, Deptt of App
Geology | 15 Prof O P Verma
Deptt of App Geology |
| 7 Prof R D Singh
Head, Deptt of Min Engg | 16 Prof N V R Subrahmanyam
Deptt of Petroleum Engg |
| 8 Prof S Sринi-Vasan
Head, Deptt of Pet Engg | 17 Prof S D Singh Deptt of, Min
Engg |
| 9 Prof R K Verma
Head, Deptt of App
Geophysics | 18 Prof A K Ghose
Deptt of Min Engg |

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19 Prof S P Banerjee
Deptt of Min Engg

20 Prof D Chandra
Deptt of App Geology

21 Prof B K Mazumdar
Deptt of Min Engg

22 Prof S K Bordia
Professor of Continuing
Education

23 Prof K R Nag
Deptt of Physics &
Mathematics

24 Prof A K Mishra
Deptt of Min Engg

25 Prof B B Bhattacharya
Deptt of App Geophysics

26 Dr T Narashingham
Asstt. Professor

27 Shri Dinesh Chandra
Asstt Professor
Deptt of Physics and
Mathematics

28 Dr N S Rawat
Asstt Professor Deptt of Chem
Fuel & Metallurgy

29 Prof S K Bordia
Registrar (Secretary)



ANNEXURE VII(B)

COMPOSITION OF BOARD OF RESEARCH STUDIES
(as on June 30, 1977)

Chairman

- 1 Prof G S Marwaha Director

Members

- 2 Dr B K Banerjee
Manager (R & D), P & D Division,
Fertilizer Corporation of India, Sindri.
- 3 Dr B Singh
Dy. Director, Central Mining Research Station, Dhanbad
- 4 Prof R D Singh, Head, Deptt of Min Engg
- 5 Prof S D Singh
- 6 Prof A K Ghose
- 7 Prof S P Banerjee
- 8 Prof B K Mazumdar
- 9 Prof A K Mishra
- 10 Prof S Srini-Vasan, Head, Deptt of Pet Engg
- 11 Prof N V R Subrahmanyam
- 12 Dr S K Baijal
- 13 Prof S N Sarkar, Head, Deptt of App Geology
- 14 Prof O P Verma
- 15 Prof D Chandra
- 16 Dr K L Rai
- 17 Prof R K Verma, Head, Deptt, of App Geophysics
- 18 Prof B B Bhattacharya
- 19 Dr R K S Chauhan
- 20 Prof K R M Rao, Head, Deptt of Engg & Min Machinery
- 21 Shri D K Mitra
- 22 Prof T C Rao, Head, Deptt of Chem, Fuel & Metallurgy
- 23 Dr N S Rawat
- 24 Prof S N Mitra, Head, Deptt of Physics & Mathematics
- 25 Prof K R Nag
- 26 Prof D K Sinha, Head, Deptt of Ind Engg & Management
- 27 Shri D P Jha, Head, Deptt of Humanities & Social Sciences
- 28 Prof S K Bordia, Professor of Continuing Education & Registrar

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ANNEXURE VII(C)

COMPOSITION OF EXAMINATION BOARD

Chairman

Prof G S Marwaha, Director

Members

- 1 Prof S N Sarkar, Head, Deptt of App Geology
 - 2 Prof R D Singh, Head, Deptt of Min Engg
 - 3 Prof S Srini-Vasan, Head, Deptt of Pet Engg
 - 4 Prof R K Verma, Head, Deptt of App Geophysies
-

ANNEXURE VII(D)

COMPOSITION OF BOARDS OF COURSES AND STUDIES
APPLIED GEOLOGY*Convener :*

- 1 Prof S N Sarkar, Head/Deptt of App Geology

External Members

- 2 Prof T C Bagchi
Deptt of Geology
Indian Institute of Technology
Kharagpur
- 3 Prof A K Saha
Professor of Geology
Presidency College
Calcutta-12
- 4 Prof Bankim Mukherjee
Professor of Geology
Department of Sciences
Jadavpur University
Calcutta-32
- 5 Director-General
Geological Survey of India
27 Jawaharlal Nehru Road
Calcutta-13
(or his nominee)
- 6 Prof Y J Rao
Professor of Geology
Osmania University
Hyderabad-7
- 7 Prof K K Singh
School of Studies in Geology
Vikram University
Ujjain
- 8 Prof B B S Singhal
Deptt of Geology and
Geophysics
Roorkee University
Roorkee
- 9 Managing Director
Mineral Exploration
Corpn Ltd
Nagpur
(or his nominee)

Internal Members

- 10 Prof O P Verma
Deptt of App Geology
- 11 Prof R K Verma
Head/Deptt of App
Geophysics
- 12 Prof S D Singh
Deptt of Min Engg
- 13 Prof S N Mitra
Head/Deptt of Physics and
Mathematics
- 14 Prof T C Rao
Head/Deptt of Chem, Fuel &
Metallurgy
- 15 Prof D Chandra
Deptt of App
Geology
- 16 Dr T Narsimhan,
Deptt of App Geology
- 17 Shri Y K Agarwal
Deptt of App Geology
- 18 Dr K L Rai
Deptt of App Geology
- 19 Dr S N Rai
Deptt of App Geology

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APPLIED GEOPHYSICS

Convener

- 1 Prof R K Verma, Head/Deptt of App Geophysics

External Members

- 2 Dr H K Gupta
National Geophysical
Research Institute
Hyderabad
- 3 Prof V Bhaskara Rao
Head/Deptt of Geophysics
Andhra University
Waltair
- 4 Prof C L Singh
Head/Deptt of Geology and
Geophysics
Banaras Hindu University
Varanasi
- 5 Prof V K Gaur
Head/Deptt of Geophysics
Roorkee University
Roorkee
- 6 Prof D K Ganguli
Head/Deptt of Geology and
Geophysics
Indian Institute of Technology
Kharagpur
- 7 Shri A N Dutta
Chief Geologist
Oil and Natural Gas
Commission
Hyderabad
- 8 Incharge
Well logging Section
Institute of Petroleum
Exploration
Oil and Natural Gas
Commission
Dehradun
- 9 Shri L N Kailasam
Chief Geophysicist
Geological Survey of India
Calcutta

Internal Members

- 10 Prof B B Bhattacharya
Deptt of App Geophysics
- 11 Prof O P Verma
Deptt of App Geology
- 12 Prof S N Mitra
Head/Deptt of Physics and
Mathematics
- 13 Prof K R M Rao
Head/Deptt of Engg &
Min Machinery
- 14 Shri Alam Chand
Deptt of Min Engg
- 15 Dr R K S Chouhan
Deptt of App Geophysics
- 16 Dr M K Rao
Deptt of App Geology

CHEMISTRY FUEL & METALLURGY*Convener*

- 1 Prof T C Rao Head/Deptt of Chem Fuel and Metallurgy

External Members

- 2 Shri G G Sarkar
Dy Director
Central Fuel Research
Institute, Dhanbad
- 3 Dr G P Mathur
Project Officer
National Metallurgical
Laboratory
Jamshedpur
- 4 Prof A N Roy
Head/Deptt of Chemical Engg
Indian Institute of
Technology
Kharagpur
- 5 Shri G V Subramanyam
General Manager
(Process Development)
National Mineral
Development Organisation
Hyderabad
- 6 Shri N M Subramanyam
Supdt Engineer
Indian Bureau of Mines
Nagpur
- 7 Shri B Sharan
Central Coalfields Ltd
Darbhanga House
Ranchi
- 8 Shri P R Sinha
General Manager
Central Coal Washeries
Organisation/HSL
Dhanbad
- 9 Shri R N Khare
Project Manager
Indian Copper Corpn Ltd
P O Ghatsila
Distt Singhbhum

Internal Members

- 10 Prof D K Sinha
Head/Deptt of Engg and
Management
- 11 Prof S N Sarkar
Head/Deptt of APP Geology
- 12 Prof K R Nag
Head/Deptt of Maths &
Physics
- 13 Prof K R M Rao
Head/Deptt of Engg & Min
Machinery
- 14 Shri J N Chakraborty
Deptt of Chem Fuel &
Metallurgy
- 15 Dr N S Rawat
Deptt of Chem Fuel &
Metallurgy
- 13 Shri S V B Subba Rao
Deptt of Chem Fuel &
Metallurgy
- 17 Shri N K Prasad
Deptt of Chem Fuel &
Metallurgy

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ENGINEERING AND MINING MACHINERY

Convener :

- 1 Prof K R M Rao, Head/Deptt of Engg and Min Machinery

External Members

- 2 Shri K S Ghosh
Addl Chief Engineer (E & M)
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- 19 Prof A K Mishra
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- 20 Shri N K Patnaik
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PETROLEUM TECHNOLOGY

Convener

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- 17 Shri G S Mony
Deptt of Pet Engg
- 17 Dr S K Baijal
Deptt of Pet Engg

**LIST OF ORGANISATIONS WHO HELPED I S M
IN ITS VARIOUS ACTIVITIES**

Amrita Bazar Patrika Press, Calcutta
 Assam Oill Co Limited, Digboi
 Barauni Refinery, Barauni
 Bharat Coking Coal Limited, Jharia
 Bhart Gold Mines Private Ltd, Orgeaun
 Bihar Electricity Board, Gomoh
 Birla Industrial and Technological Museum, Calcutta
 Block Developmant Officer, Topchanchi
 Bokaro Steel Limited, Bokaro Steel City
 Central Mining Research Station, Dhanbad
 Central Water and Power Commission, Poona
 Central Fuel Research Institute, Digwadih
 Central Mines Planning & Design Institute, Ranchi
 Coal India Limited, Calcutta
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 Fertiliser Corporation of India, Sindri
 Hindustan Copper Ltd, Mosabani and Khetri
 Hindustan Steel Ltd, Ranchi
 Hindustan Zinc Ltd, Zawar
 Indian Institute of Petroleum, Dehradun
 Indian Iron & Steel Co Ltd, Burnpur
 Indian Oil Corporation, New Delhi
 INSDOC, New Delhi
 Institute of Petroleum Exploration, Dehradun
 Maithon Refractories, Kumardhubi
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 Oil India Ltd, Duliajan
 Oil and Natural Gas Commission, Dehradun
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 Singareni Collieries Co Ltd, Kothagudium
 Tata Iron & Steel Co Ltd, Jamshedpur
 Uranium Corporation of India Ltd, Jaduguda



II | *Departmental Reports*

Departmental
Reports

II

1 DEPARTMENT OF APPLIED GEOLOGY

1 Academic & Field Activities

1.1 *Changes made in Syllabus and new courses*

(a) A one-year M Sc Tech (Mineral Expn) course for M Sc (Geol)/MSc (App Geol) was started.

(b) In the meeting of the Board of Courses & Studies (BOCS) in App Geology, held on 30th Apr, 1977 certain changes were made in the Syllabi for B Sc (Hons), M Sc Pt I and M Sc Pt II (App Geology) and in the M Sc Tech (Mineral Expn) course, in addition to making some other recommendations about examination schemes, allocation of marks, practical training programmes, etc

1.1.2 Field trips and training programmes

(1) The M Sc Tech (Mineral Expn) students went for practical training in several mining districts of Rajasthan and U P for about two weeks during Dec - Jan, under the supervision of Prof O P Varma

(2) The V year M Sc (App Geology) students went on an excursion to various places of geological interest in India for about three weeks from 29th Dec, 1976, under the guidance of Dr M Prakash

(3) The V year M Sc (App Geology) students undertook training in underground geological mapping at Mosabani mines during Jan 26 - 31, 1977, under the guidance of Dr K L Rai

(4) The V year M Sc (App Geology) students carried out field - work for their theses from Sept 20 to Oct 9, 1977

(5) The IV year M Sc (App Geology) students took three weeks training in structural and geological mapping in the Precambrians of Ghatsila - Galudih area from Dec 18, 1976 to Jan 7, 1977, under the guidance of Shri J P Tiwari and Shri A Hussain. Prof S N Sarkar also guided them during Dec 19 - 24, 1976

(6) The III year App Geology and App Geophysics students took training in the Jharia Coalfield - during Dec 20 - 31, 1976, under the guidance of Prof D Chandra, Shri K S V Ram and Dr M S Naik

(7) The II year 'C' students went out for one - day field - work to Jamuniatand on Feb 19, 1977 with Shri K S V Ram and Sri A Hussain and the II year 'A' & 'B' students on Feb 28, 1977 with Shri J P Tiwari and Dr M Prakash

(8) The V year M Sc (App Geology) students were taken out for one - day field - work to Tenughat area on Mar 24, 1977 with Shri Y K Agarwal and Dr M Prakash

(2)

(9) Prof S N Sarkar and Dr S N Rai went to Kodarma - Gurpa - Gujhandi area for a week's field-work and research guidance during Mar 24 - 30, 1977, to research fellow/workers N B Chanda, B K Choudhury and B K Upadhyay.

(10) The M Sc Tech (Mineral Expn) students underwent six weeks field training in mineral exploration from the last week of Feb, 1977 Prof O P Varma visited the areas of some students in Assam and Karnataka from Mar 25 for about three weeks

(11) In connection with his SERC project "Tectonic evolution, magmatism and mineralization in the Sukinda ultramafic belt Orissa". Prof O P Varma spent about a week in the Sukinda Chromite belt to provide field guidance to two of his research workers

(12) In connection with the CSIR Project "Structural, stratigraphic and geo-chemical investigation on Sausar Group rocks and associated manganese ore deposits in central part of manganese ore belt of M P & Maharashtra, Dr K L Rai spent a week at Chikla - Sitasongi mine area in Apr 1977 to provide field guidance to the concerned Research Scholar.

1.2 Research activity/publications

1.2.1 Research work completed

(1) Shri M Prakash was awarded the Ph D degree of ISM in Oct 1976 for his project "Studies on Amphibolite of the Western part of Bihar Mica belt" carried out under the guidance of Dr S N Rai

(2) Shri B Banerjee, Scientist/C F R I, submitted his theses on "Geology, Petrology & Petrochemistry of Rajasara coals - Daltonganj coalfield, Bihar with special reference to metamorphism of coals" for Ph D degree of ISM in Jun 1976 based on work carried out under the joint guidance of Dr K L Rai and Shri B K Mojumdar

(3) Shri P R Paul (earlier CSIR Fellow, and later with CMPDI/Ranchi) submitted his theses on "Stratigraphy, Structure and Ore Geology of Noamundi, Manikpur region, Singhbhum dist Bihar with special reference to Iron Ore deposits" for Ph D degree of ISM in Jan 1977, based on work carried out under the joint guidance of Prof S N Sarkar and Dr K L Rai

(4) Shri G P Srivastava, Associate Professor of Bihar Institute of Technology/Sindri, submitted his theses on "Geology and Petrology of coals of Jharia coalfield affected by heat" for Ph D Degree of ISM in Jun 1975 based on work carried out under the guidance of Prof D Chandra

1.2.2 Research project in progress

- (1) "Structure, stratigraphy and geochemistry of the Sausar Group rocks in Dongri Buzurg - Chikla area, Bhandra dist, Maharashtra" with special reference to Manganese - Ore deposits CSIR Research Scheme under the guidance of Prof S N Sarkar and Dr K L Rai (Shri Gautam Konar, Jr Research Fellow started working under this scheme from 1st Sept, 1976)
- (2) "Structure, stratigraphy and geochemistry of Sausar Group rocks in Kurmura and Sitekesa area, Bhandra dist, M P with special reference to Manganese - ore deposits", by Shri K V V S Gautam, CSIR Jr Research Fellow, under the joint guidance of Prof S N Sarkar and Dr K L Rai
- (3) "Structural analysis of triclinic tectonites of the precambrians of Ghatsila - Dhalbhumgarh area, East Singhbhum", by Shri A Hussain, ISM Lecturer in Geology, for Ph D degree, under the guidance of Prof S N Sarkar
- (4) "Structure and Petrology of a part of Bihar mica belt in Gurpa area with special reference to mica pegmatites", by Shri N B Chanda, ISM Research Fellow, under the guidance of Prof S N Sarkar and Dr S N Rai
- (5) "Structure and stratigraphy of a part of the Bihar mica belt, with special reference to the mica - bearing pegmatites in Kodarma area" by Shri B K Upadhyay of B I T Sindri, under the joint guidance of Prof S N Sarkar and Dr S N Rai
- (6) "Geomorphological and geotectonic study of Doon Valley in relation to uplift in Lesser Himalaya", by Prof D P Rao of Indian Photo Interpretation Institute/Dehradun, under the joint guidance of Prof S N Sarkar and Dr S N Rai
- (7) "Study of chromite deposits in the south-western part of Sukinda ultramafic belt", by Shri K N Jha Lecturer in Geology, for Ph D degree, under the guidance of Prof O P Varma
- (8) "Chemical and geochemical differentiation of the ultramafic intrusive and investigations of oxidized products of chrome ore of the Sukinda mining district, Orissa", by Shri V K Jain, under the guidance of Prof O P Varma
- (9) "Optimal plan for iron - ore exploration in India and possible development by 2000 AD", (Interdisciplinary project) by Prof R T Deshmukh, under the guidance of Prof O P Varma
- (10) "Structural analysis and geochemistry of the Nousahi ultramafites and associated chromite deposits in the Keonjhar district, Orissa", by

(4)

Shri A M Jaipuriar, Senior Geologist/ BCCL, under the guidance of Prof O P Verma

(11) "Sulphide mineralization in southern parts of Sikkim", under the guidance of Prof O P Varma

(12) "Geology and Petrology of Korba coalfield with special reference to the utilisation aspects of Korba coals for the production of fertilizer", by Shri A K Samsuddin of (P & D Division) FCI/Sindri, under the guidance of Prof D Chandra

(13) "Geology of the Jharia coalfield with particular reference to the sub-surface distribution of the coal seams", by Shri N Sengupta of G S I, under the guidance of Prof D Chandra

(14) "Effect of Geology on the distribution of gases in the coal seams of the Jharia coalfield", by Shri R P Verma of BCCL, under the guidance of Prof D Chandra

(15) "Relation between geology and fall of roofs and sides in the coal seams of the Jharia Coalfield", by Shri K Sanyal of CMPDI, under the guidance of Prof D Chandra

(16) "Geology and distribution of sulphur in Assam coals" by Shri S C Chowdhury, under the guidance of Prof D Chandra

(17) "Ore Geology and Geochemistry of Polymetallic sulphide mineralization in Ambamata - Banskantha dist, Gujarat", by Shri A K Sinha, under the guidance of Dr K L Rai

(18) "Geochemical investigations of the Kalyadi copper belt Karnataka", by Shri N R Bhattacharya, under the guidance of Dr M S Naik (CSIR Project)

(19) "Geochemistry of carbonatites of Amba Dongar, Gujarat", by Shri A K Agrawal, under the guidance of Dr M S Naik

(20) "Stratigraphy - tectonics and Petrology of the Dongargarh super-group in Salekasa - Dongargarh region, M P", by Shri J P Tiwari, ISM Lecturer in Geology, for Ph D degree under the guidance of Prof S N Sarkar

(21) "Basic magmatism in relation to sulphide mineralization in certain Precambrian mineralized belts of India", by Shri M Alam, under the guidance of Dr K L Rai and Dr M Prakash

(22) "Structure and Petrology of Kodarma-Khalaktambi area, Bihar by Shri B K Choudhury", under the joint guidance of Prof S N Sarkar and Dr S N Rai

1.2.3 M Sc Theses

- (1) Shri M A Siddique completed his M Sc theses work on "Ore Geology of sulphide mineralization at Rajpura - Dariba belt, Rajasthan under the guidance of Dr K L Rai
- (2) Shri D C Srivastava completed his theses work on "A study of Deri Mining District with special reference to its structure, Tectonism, Petrology & Ore Geology", under the guidance of Prof O P Varma
- (3) Shri M Imran completed his theses work on "Rewat Hills Tungsten Deposits, Degana, Nagaur dist Rajasthan", under the guidance of Prof O P Varma
- (4) Shri C L Choudhury completed his M Sc theses work on the problem entitled "Structure of Sausar group rocks of Chikla area, Bhandara dist, Maharashtra under the guidance of Prof S N Sarkar
- (5) Shri K Majumdar completed his M Sc thesis work on "Geology of Makum coalfield, Dist Dibrugarh, Assam", under the guidance of Shri K S V Ram
- (6) Shri Nitish Roychoudhury completed his M Sc theses work on "Distribution of Kalimati seam west of Raniganj coalfield", under the guidance of Prof D Chandra
- (7) Shri S Islam completed his M Sc thesis work on "Cleat pattern in coals and its relation to methods of Mining", under the guidance of Prof D Chandra

1.2.4 Sponsored research :

- (a) A multidisciplinary project (sponsored by CMPDI) on "Desulphurization of Assam coals by bacterial means", under the guidance of Prof D Chandra in progress.
- (b) An SERC project on Tectonic evolution, magmatism and mineralisation of the Sukinda ultramafic belt", has been started under the guidance of Prof O P Varma

1.2.5 Collaborative research :

- (a) Collaborative research work was undertaken by Prof S N Sarkar with Prof A K Saha (of the Presidency College, Calcutta), the Z.W O Laboratorium Voor Isotopen Geology Amsterdam Holland) and the Physical Research Laboratory (Ahmedabad) on the problem "Sr-Rb Geochronology of the Older Matamorphics, Singhbhum granite and Iron Ore Group of rocks in Singhbhum regions and on the Precambrians of Bhandara Drug region, M P",

(6)

- (b) Prof D Chandra is working in collaboration with CMPDI on "The origin of Rajhara coals of the Daltonganj coalfields",
- (c) Collaborative research work was done by Prof S N Sarkar and Dr K L Rai with C F R I, G S I (Geochemical and Mineral Physics Division), NGRI and Presidency College (Calcutta) in connection with departmental research project on "Structure, stratigraphy and geochemistry of manganese ore-belt of Maharashtra and M P and Iron ore belt of Jamda - Koira valley of Orissa and Bihar"
- (d) Dr K L Rai and Dr M Prakash have undertaken collaborative research with Dr R T Shukla, Director of Geology & Mining, Govt of Gujarat, on "Geochemical study of Polymetallic sulphide mineralization and a project related geologic environment around Ambamata, Banas - kantha dist, Gujarat"

1.2.6 Inter-departmental programme :

- (a) The following two inter department projects are being taken up with UGC assistance both Geological studies for locating and developing mica in Bihar Mica belt jointly with the ISM Department of Applied Geophysics
- (b) Geology, Geochemistry and Genetic Systematics of stratiform base metallic deposits in the Precambrian Complexes of India

1.2.7 Other Research projects : The following other projects have received sanction

- (1) Geology, Geochemistry & Genetic systematics of Stratiform base metallic deposits in the Precambrian complexes of India (UGC project)
- (2) Structure and stratigraphy of the Iron Ore Group in Noamundi - Joda - Gua areas in Bihar - Orissa (UGC Project)
- (3) Economic Geology of deposits of ferro - alloy metals (wolframite, chromite, vanadium-bearing titaniferous magnetite, ilmenite, etc) (UGC Project)
- (4) Stratigraphy, Tectonics & Geochemistry of Iron Ore Group Singhbhum Group and associated rocks south and north of the Copper-Belt thrust zone in certain critical areas (ISM Project)
- (5) Sedimentation & Tectonics of Gondwana coal basins in critical regions (ISM project)
- (6) Stratigraphic, Tectonic and Geochronologic investigations in precambrian mineralised belts in certain critical areas (ISM project)
- (7) Sulphide Mineralisation in Southern part of Sikkim (ISM project)

3.1 Research articles published

- 1 Sarkar S N Gautam K V V S & Ray S (1977)
"Structural analysis of a part of the Sausar Group Rocks in Chikla-Sitekesa area" (Geological Society of India)
- 2 Sarkar S N & Saha A K (1977)
"Present status of Precambrian stratigraphy, tectonics and geochronology of Singhbhum-Keonjhar-Mayurbhanj region, Eastern India (Indian Journal of Earth Sciences (S Ray Volume)
- 3 Sarkar S N Saha A K Hebeda E G and Boelrij NAIM
"Geochronology of the older metamorphic group and the Singhbhum Granite of Singhbhum-Keonjhar-Mayurbhanj region, Eastern India (in press)
- 4 Sarkar S N & Gautam K V V S (1977)
"Tectonic pattern of a part of Sausar Group rocks in Dongri-Buzurg-Sitekesa area, Bhandara Dist, Maharashtra" (Proc Ind Sci Cong, 64th Session) (Abst)
- 5 Sarkar S N & Dutta S M (1977)
"Structural analysis of a part of the folded Garhwal nappe around Lansdowne, U P "(Himalayan Geology Semlnar, New Delhi Vol of Abstracts, P - 84) (Paper to be published in Sep 1977 proceedings of the Seminar)
- 6 Sarkar S N and Saha A K (1976)
"Structurel framework and tectonic evolution of the Singhbhum - Keonjhar - Mayurbhanj region on the basis of Landsat Imagery and other data" (Golden Jubillee National Symposium on Precambrian Stratigraphy Tectonics and Associated Mineral Deposits of India. Nov 12-13, 1976) (Abst)
- 7 Sarkar S N & Rai S N (1976)
"A satellite view of the Bihar Mica belt and the adjoining region (Golden Jubillee National Symposium on Precambrian Stratigraphy, Tectonics and Associated Mineral deposits of India, ISM Nov 12 - 13, 1976) (Abst)
- 8 Sarkar S N & Basu Aniruddha (1976)
"Tectonic analysis of the cross folded Singhbhum group rocks south of Dalma thrust in East Singhbhum" (A synopsis) (Golden Jubilee National Symposium on Precambrian Stratigrphy), Tectonics and Associated Mineral deposits of India, ISM, Nov 12 - 13, 1976) (Abst)

- 9 Varma O P
"Mineralogy of the Chhendapathar tungsten deposits, West Bengal, India" (Journ Mineral Soc Ind) (in press)
- 10 Varma O P & Singh V K
"Iron - manganese rations in wolframites as geologic thermometers"
(Jour Geol Soc India, Vol. 18, No 3, pp. 125 - 128, 1977)
- 11 Varma O P & Singh V K
"Tungsten deposits of Chhendapather, District Bankura, West Bengal"
(Deptt of Applied Geology Golden Jubilee Monograph, ISM)
(in press)
- 12 Varma O P & Jaipuria A M
"Chrome ore in India - its strategic importance, domestic resources and gaps, long - term projections and its future outlook" (Proc Ind National Sc Acad, Vol 42, Part A, No 4, pp 271 - 291, 76)
- 13 Varma O P and Jaipuria A M
"Statistical studies of trace element abundances in chrome-ore bodies for possible application in mineral exploration" (Second symposium on the origin and distribution of the elements, Paris, UNESCO, May 10-13, 1977, Abstracts Resume, p 163)
- 14 Varma O P & Singh V K
"Geochemistry of Feberites from Chhendapathar, District Bankura, West Bengal, India" (Chayanica Geological, Vol 2, No 2, pp 146-155, 1976)
- 15 Varma O P & K N Jha
"Potentials & prospection of chrome ore in Eastern India" (Golden Jubilee Interdisciplinary Seminar on Mineral Development in Eastern India, ISM, Dhanbad, Dec 5-6, 1976)
- 16 Varma O P Rai K L Gupta V K & Chanda N.B (1976)
"A study of sulphide metallogenesis in the Himalaya in relation to large-scale exploration programmes" (Section IV (Mineral Resources) of "Himalayan Geology Seminar. organised by Ministry of Steel & Mines, New Delhi Sept 13-17, 1977) (Full text in press)
- 17 Chandra D Choudhury R and Srivastava G P (1976)
"Interaction between theigneous intrustives and the Gondwana coals with special reference to Petrology" (International Gondwana Symposium)

- 18 Shukla R T Rai K L & Sinha A K (1976)
 "Polymetallic sulphide mineralization at Ambamata, Banakantha district, Gujarat" (Golden Jubilee National Symposium on Precambrian stratigraphy, tectonic and associated mineral deposits of India ISM, Nov 12 - 13, 1976 pp: 74 - 75) (Abst.)
- 19 Rai K L (1976)
 "Micromineralogy and geochemistry of sphalerites from sulitjelma Mining district" Norsk Geol Tidss, Oslo (in press)
- 20 Rai K L (1976)
 "Ore genetic aspects of the geochemistry of sulphide ores from Sulitjelma mining dist, Norway" Norsk Geol Tidss, Oslo (in Press)
- 21 Rai K L (1976)
 "Need for systematic and integrated geological documentation in Mines" (The New Sketch, Special number, 1976, pp. 216 - 226)
- 22 Rai K L (1976)
 "New vistas and tasks of mineral exploration and related research with special reference to Eastern India" (Golden Jubilee Inter-disciplinary Seminar on "Mineral Development in Eastern India" ISM, Dec 5 - 6, 1976) (Abst.)
- 23 Rai K L and Marwaha G S (1976)
 "Rewarding exploration activity, but a long way to go" (Commerce, Annual Number Vol. 133, Oct 1976, pp 121 - 129)
- 24 Rai K L Jaheer B and Hansda S N (1976)
 "Sulphide mineralization at Ingaldhal, Chitragurga Dist Karnataka" (Golden Jubilee National Symposium on Precambrian Stratigraphy, Tectonics and Associated Mineral Deposits of India ISM, Nov 12 - 13, 1976 pp. 73 - 74) (Abst)
- 25 Rai K L & Paul P R (1976)
 "Micromineralogy of hematite in bande hematite jasper and associated Iron - ores of Noamundi Region Singhbhum district, Bihar" (Golden Jubilee National Symposium on Precambrian Strati raphy, Tectonics and Associated Mineral Deposits of India, ISM, Nov 12-13, 1976, pp. 93 - 94) (Abst)
- 26 Rai K L and Paul P R (1976)
 "Primary depositional and diagenetic features in the Iron formation around Noamundj, Singhbhum District, Bihar" (Contributed under

section V (Mineral Deposits) of the proceedings of Indian Geological Congress, First Session, University of Delhi, Nov 29 - Dec 1, 1976)

27 Rai K L & Shukla R T (1977)

"Depositional environment and origin of coal in Peneh - Kanhan Valley coalfield, M P India, (IV International Gondwana Symposium, Calcutta, Jan 17 - 22, 1977) (Abst) (full text in press)

28 Rai K L & Shukla R T (1977)

"Some aspects of Motur sedimentation in Satpura Gondwana basin, M P India" (IV International Gondwana Symposium, Calcutta, Jan 17 - 22, 1977) (Abst) (full text in press)

29 Rai K L Tiwari J P and Shukla R T (1977)

"Some aspects of exploration and development of fluorite deposits of India with special reference to M P and Gujarat" (Seminar on "Mineral Resources of Madhya Pradesh - their exploration and exploitation" Organised by the Institution of Engineers (India), Jabalpur, May 5 -6, 1977)

30 Rai K L & Gautam K V V S (1977)

"A study of Iron formations and associated iron ore deposits around Gua, Singhbhum Dt Bihar" (Journal of Min Met Fuels No 25, No - 4 p - 111 - 118 Apr 1977)

31 Rai S N (1976)

"Use of air photographs in the reconstruction of Jharia coalfield" (New Sketch, Vol 34, No 45, p 31 - 32)

32 Rai S N (1976)

"Contributions of the geologist to Coal Industry" (New Sketch, Vol 36, No 51, p 25 - 27)

33 Rai S N (1976)

"A review of Talc, steatite and soapstone" (IBM Bulletin No 2 Mines, Metals & Fuels, Oct 1976, p 312)

34 Rai S N (1976)

"A review of Asbestos and Barytes" (IBM Bulletin No 1 Mines, Metals and Fuels, Nov 1976, p 344)

35 Rai S N & N L Sharma (1976)

"Some uncommon minerals of the Bihar mica belt" (Interdisciplinary Seminar on "Mineral Development in Eastern India", ISM Abst Vol) (Also in New Sketch Republic Day Member 1977)

- 36 Rai S N (1976)
"A review of Kyanite & Sillimanite" (IBM Market Survey Report, No 2 : Mines, Metals & Fuels, Dec p 374)
- 37 Rai S N (1977)
"Role of remote sensing in the conservation of mineral sources" 64th Ind Sci Cong, Pt III, p 53 - 54)
- 38 Rai S N (1977)
"Geology : the confluence of Physical and social science", (Ind Assoc Hist Phil Sci, Abst Vol)
- 39 Rai S N (1977)
"Cultural Geology and its application in Management Technology" (ISM Magazine)
- 40 Rai S N (1977)
"Influence of traditional beliefs on the development of science" (Inter Symp Social, Political, Cultural for Human Development, Dept of Science and Technology, New Delhi)
- 41 Rai S N (1977)
"Science supports Total Revolution" (New Sketch, Vol XXXVII, Nos 36 - 37, p 27 - 30 and 27 - 28, Jun 1977)
- 42 Naik M S (1976)
"Relationship between carbonatite and fluorite mineralisations at Amba Dongar, Gujarat" (Proc Seminar on the Carbonatite - Kimberlite complexes of India, p17)
- 43 Naik M S (1976)
"(Co, Ni) SbS phases and argentian boulangerite in galena from Easpe - lond, Norway" (Norsk, Geol, Tiddskript Vol 62, 1976, p 1 - 9)
- 44 Naik M S
"Structure and tectonics of the rocks at Molakalamuru, Karnataka" (Abstracts National Symposium, ISM, 1976, p 41)
- 45 Naik M S
"Geochemistry of the anorthosites and associated rock of Banpur, Puri Dist Orissa" (Proc Ind Geol Cong First Session, 1976, p 62)
- 46 Naik M S
"Origin of the anorthosite and related rocks of Banpur, Puri district, Orissa" (Proc Ind Geol Cong, First Session, 1976, p 63)

47 Naik M S

"Rare earth element distribution in anorthosite and related rocks, Banpur, Puri district, Orissa, India" (Jour of Petrology, Vol 28, 1976, p 34 - 41)

48 Tiwari J P

"Ocean the store house of minerals" (Golden Jubilee Issue of I S M Magazine)

49 Tiwari J P

"PRACHIN BHARAT MEN KHANAN" (Golden Jubilee Volume of ISM Magazine)

1.4 Consultancy projects

Following interdisciplinary projects were undertaken jointly by with the ISM Deptt, of Min Engineering :

- (1) The investigation into the stability of rocks at the site of New Barakar Bridge (N H 2) (Project completed)
- (2) Differentiation of hard and soft rocks obtained from cutting along approach road (Dhanbad side) to the proposed Telmuchu Bridge on Mile 34 of (N H 32) in Gobindpur - Chas Section (Project completed)
- (3) Investigation into the stability of rocks at the site of New Telmuchu bridge (N H 32) (Project under progress)

1.5 (a) Guest Lectures

- (1) Prof C S Pichamuthu, Ph D, D Sc, F N A, President Geological Society of India, Bangalore delivered Golden Jubilee Lectures on the "Significant advances in Geology during the last 50 years" on Oct 14 - 16, 1976
- (2) Prof U Aswathanarayan, D Sc, F N A, Professor of Geology and Dean of Technology, University of Saugar, Saugar delivered Golden Jubilee Lectures on the "Recent advances in the techniques of exploration" on Oct 18, 1976
- (3) Under the Golden Jubilee Celebration programme Shri K Rajagopalaswamy, Ex-chief Geologist, A C C gave a series of lectures on "Our diminishing mineral resources" on Oct 19 - 21, 1976
- (4) Prof P Allen, F R S delivered a Golden Jubilee lecture on "Glaciations in the Sahara" in Dec, 1976
- (5) Prof Zbigniew Wilk, M Sc, Ph D, D Sc, Professor and Vice-Director for Research Institute of Hydraulics and Engineering Geology of Stanislaw Staszic Technical University of Mining and Metallurgy

(Poland) delivered a special lecture on "An outline of the mineral deposits of Poland and their hydrogeological conditions" on Mar 10, 1977

(6) Prof R P Sharma Institute of Photo - interpretation, Dehradun, delivered a series of special lectures and conducted practicals on "Photogeology and remote sensing and their application in mineral exploration" during Feb 1 - 3, 1977

(7) Shri S K Roy of Map Division, Geological Survey of India, Calcutta, delivered special lectures on "Geological map preparation and cartography" on Feb 7 - 8, 1977

(8) Prof R K Varma Head of the ISM Dept of App Geophysics delivered a series of three special lectures on "Plate Tectonics and Polar Wandering" on the Feb 7 - 9, 1977 for the students of V year Applied Geology and M Sc Tech (Mineral Expn)

(9) Shri R P Varma, Superintending Geologist, CMPDI, delivered a series of lectures on "Coal exploration" for M Sc Tech (Mineral Explan) students on Nov. 26 - 27, 1976

(10) Prof R T Deshmukh, Director of Practical Training in Mining delivered a series of lectures on "Valuation of Mining and Mineral properties" for M Sc Tech (Mineral Explan) students on Oct 12 - 13, 1976

(11) Shri S C Srivastava, Sr Geologist, Mineral Exploration Corporation of India, delivered a series of lectures for M Sc Tech (Mineral Exploration) students on "Mining Geology and Mineral Exploration" in the last week of Jan, 1977 .

1.6 Special lectures delivered by Departmental staff

(1) Prof O P Varma delivered four lectures on 'Exploration Programmes' and 'Exploration procedure' to the participants of the Short Course on Surface Mining, organised by the ISM Department of Mining Engineering from Oct 25 to Nov 5, 1976

(2) Prof D Chandra delivered lectures on "Coal resources in India and coal preparation by petrographic means" to the participants of Short course in 'Coal Preparation' organised by the ISM Dept of Chemistry, Fuel and Metallurgy during Oct 11 - 23, 1976

(3) Shri Y K Agarwal and Shri A Hussain delivered lectures on different topics of geology in intensive programme on "Mine Surveying" organised by the Dept of Min Engg, ISM, between 1st Feb to 19th Mar 1977.

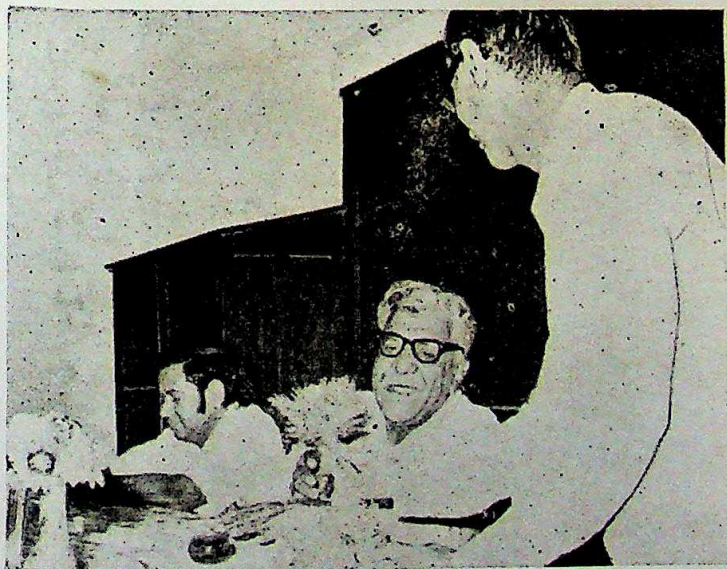
- (4) Shri J P Tiwari delivered lectures on 'Exploration for coal and metalliferous deposits' in a short course on elements of mining for non-mining executives 'organised by the ISM Dept of Min Engg between Dec 13 - 18, 1976
- (5) Dr K L Rai delivered a series of lectures on different topics in Geology to the participants of UGC - sponsored summer Institute in "Geotechniques in Earth Sciences" organised by the ISM, Dept of App Geophysics, between May 23 and Jun 11, 1977
- (6) Dr S N Rai delivered lectures and conducted paracticals in the short - term and intensive courses in 'Surface Mining' and "Mine Surveying" organised by the ISM Department of Min Engg
- (7) Prof O P Varma was Chief guest at the annual functions of the Geological Societies of the Departments of Geology of the Vikram University (Ujjain) and the Andhra University (Waltair)

1.7 Attendance, participation in Seminars, Conferences, Workshops

- (1) Prof S N Sarkar attended the Himalayan Geology Seminar held at Delhi during Sep 13 - 16, 1976, and presented a paper on "Tectonic analysis of folded Garhwal nappe around Lansdowne, U P"
- (2) Prof O P Varma and Dr K L Rai submitted a joint paper on the "Sulphide metallogenesis in the Himalaya in relation to largescale exploration programmes" at the Himalayan Geology Seminar held at Delhi during Sep 13 - 16, 1976
- (3) Most of the members of the Department staff attended the Golden Jubilee National Inter - disciplinary Symposium on "Mineral Development in Eastern India" held at ISM on Dec 5/6, 1976
- (4) Dr K L Rai Dr S N Rai and Mr A Hussain attended the Work - shop on "Grading and Internal assessment" held by Prof V Natara,an at ISM on Nov 23/24, 1976
- (5) Prof S N Sarkar and Mr Y K Agarwal attended the 125th Anniversary Celebration of the Geological Survey of India in Calcutta on Dec 17/18, 1976
- (6) Prof S N Sarkar attended the Indian Science Congress Session held at Bhubaneswar, on Jan 3 - 6, 1977
- (7) Dr S N Rai attended the Indian Science Congress held at Bhubaneswar during Jan 2 - 7, 1977



Dr B D Nag Choudhury delivering Golden Jubilee
Distinguished Lecture.



Prof K R Nag Presenting Bouquet to the Chairman, Shri J
G Kumaramangalam during Valedictory Function of Third
Executive Development Programme on Mathematical and
Statistical Techniques for Mining Industry. Prof S K Bordia
is on the right of Chairman.

- (8) Prof S N Sarkar (Member, Organizing Committee) Prof O P Varma, Prof D Chandra, Dr T Narasimhan, Dr K L Rai and Dr S N Rai attended the 4th International Gondwana Symposium organized by the Geological Survey of India during Jan 17 - 22, 1977
- (9) Prof D Chandra attended the first meeting of the Study Group on "Petrographic Nomenclature and Measurement of Coal" held by the Indian Standard Institution at Dhanbad on Jan 12, 1977
- (10) Dr T Narasimhan attended the IVth International Polynological Congress held in Lucknow during Dec 29, 1976 to Jan 9, 1977
- (11) Prof O P Varma and Prof D Chandra attended the ASCI Wrokshop on "Management of Research" at ISM during Jan 14 - 16, 1977
- (12) Dr K L Rai and Shri J P Tiwari went to participate in the Symposium on "the Mineral Resources of M P & their exploration and exploitation" held under the auspices of Institution of Engineers (India) M P Centre, Jabalpur during Feb 11 - 13, 1977, but the Symposium was postponed due to the sad demise of the President of India, Late F A Ahmed, on Feb 11, 1977
- (13) Dr M S Naik attended the Seminar on "Carbonatite - Kimberlites complexes of India" held at Bangalore during Jul 29 to Aug 1, 1976
- (14) Dr S N Rai participated in the "Workshop on Exploration for Coal" held at Ranchi, on Sept 18, 1976

1.8 Conferences organized

Under the Golden Jubilee Celebration programme of the School a National Symposium on "Precambrian Stratigraphy and Tectonics and Associated Mineral Deposits of India" was organised by the Deptt of App Geology on 12th and 13th Nov, 1976 in which 77 papers submitted by participants from different organisations were discussed. The Symposium was inaugurated by Prof C S Pichamuthu and the Valedictory Address was given by Shri S K Mukherjee, Additional Secretary to the Govt of India in the Ministry of Steel & Mines

1.9 Training in India and Abroad

- (1) Dr M Prakash was deputed to Presidency College, Calcutta, to pursue his research work under the U G C National Associateship Scheme, from May 10 to June 30, 1977
- (2) Shri K N Jha was deputed to attend the Summer Institute on held at Calcutta from May 25 to Jun 30, 1977

1.10 Membership on Committees

(1) Prof S N Sarkar acted as an expert in Selection Committee meetings of Central Fuel Research Institute/Digwadih, Central Mining Research Station/Dhanbad, and Ministry of Education, Govt of India, New Delhi

(2) Prof O P Varma was nominated as National Lecturer in Geology (1977 - 78); was elected Council member of the Geological Society of India acted as a member of the UGC Visiting Committee for the Dept of Geology & Geophysics, Roorkee University, acted as an expert in Selection Committee meeting of Vikram University and I I T/New Delhi, and was nominated member of Board of Courses & Studies in Geology of Aligarh Muslim University

(3) Shri Y K Agrawal continued to be the Hony Local Secretary (Dhanbad) of the Mining Geological and Metallurgical Institute of India for 1976 - 77

~~1.11~~ Purchase of equipment

The following equipment were procured in connection with the development of teaching and research activities in the Department :

- 1 Zeiss Polarising Microscope Amplivol Pol D
 - 2 Zeiss Polarizing Microscope Laboval Pol U
 - 3 Rathenower Vibration Polishing Instrument
 - 4 Gestetner Duplicator Model - 320
 - 5 Mirror stereoscope - 12 Nos
 - 6 Pocket stereoscope
-

2 DEPARTMENT OF APPLIED GEOPHYSICS

2.1 Academic and field activities

2.1.1 Syllabus revision and new courses

(a) A new post - graduate M Sc Tech (Min Geophysics) programme was introduced during the year with an intake of five graduate students, the selections being made on all - India basis by merit. The syllabus for the programme includes courses on (i) geophysical instrumentation, (ii) Min geophysics, gravity and magnetic methods, (iii) interpretation techniques in min geophysics, and (iv) electrical and electromagnetic methods in min geophysics.

The M Sc Tech students are also required to undertake a project work throughout the academic year and write a dissertation at the end of the term. They have also to give a seminar on the subject of their dissertation.

(b) Project Work/Dissertation was introduced for M Sc Part II (App Geophysics) students. These students also had to deliver seminar talks on the subject of their dissertation.

2.1.2 Field trips and training programmes

(a) A geophysical excursion was arranged for M Sc (App Geophysics) Part II students from Dec 8, 1976 to Jan 2, 1977. The students visited the ONGC offices in Calcutta, NGRI and the Centre of Exploration Geophysics at Hyderabad, as well as the Institute of Petroleum Exploration at Dehradun where they were given 10 days' training in interpretation of seismic records.

(b) The students of M Sc (App Geophysics) Part I and M Sc Tech (Min geophysics) attended a 3 week geophysical training camp from Dec 10, 1976 to Jan 3, 1977, at Mosabani Mines, which area is well known for rich copper deposits along a thrust zone. They received training in the use of geophysical methods of exploration underground as well as on the surface.

Integrated geophysical surveys using magnetic, self - potential and electrical resistivity methods were conducted over parts of the Singhbhum thrust zone. The M Sc Tech (Min Geophysics) students also received training in the use of resistivity methods inside the mine at a depth of about 900 m, under the charge of Dr M Poddar, Asstt Professor. Geophysical work of this type was taken up for the first time in the country. The investigations clearly proved that resistivity

methods can be successfully employed in underground mines for locating sulphide ore deposits.

Dr M K Rao (Asst Professor) and Shri G Prasad (Lecturer) imparted field training to the M Sc (App Geophysics) Part I students in the camp

2.2 Research activities

2.2.1 Field Investigations

Field research was carried out on the following projects :

- (1) Gravity studies over the Rajmahal Hills, Eastern India by Prof R K Verma M H Ashraf and Manoj Mukhopadhyay
- (2) Gravity studies over the Daltonganj and Karanpura Coalfields by Prof R K Verma M H Ashraf A K Nag and M Mukhopadhyay
- (3) Gravity studies over South Singhbhum - by Prof R K Verma M Mukhopadhyay and A U S Sarma
- (4) Gravity studies over the Netarhat Plateau - by Prof R K Verma A K Nag and M Mukhopadhyay
- (5) Anomaly - elevation relationship for Peninsular India - by Prof R K Verma M Mukopadhyay and A U S Sarma
- (6) Gravity studies over the Indo - gangetic Plains - by Prof R K Verma M Mukhopadhyay and S N Singh
- (7) Resistivity survey over parts of the Jharia Coalfield by Prof R K Verma N C Bhuin and T K Bandopadhyay
- (8) Electrical resistivity surveys in the Jasidih and Topchanchi areas - by Shri B P Jha Lecturer in connection with his Ph D work
- (9) Three - dimensional configurations over Jharia coalfield using gravity data : R K Verma N C Bhuin and M Mukhopadhyay
- (10) Seismotectonic Studies of North - west Kashmir - R K S Chouhan
- (11) Electrical resistivity surveys - B P Jha
- (12) Electromagnetic Model Studies : Dr M Poddar
- (13) Interpretational Techniques in gravity and magnetic methods Dr B N P Agarwal

2.2.2 Laboratory researches and Modelling

- (1) A 3 - dimensional configuration of the Jharia Coalfield was prepared, using gravity data - by N C Bhuin and M Mukhopadhyay under the guidance of Prof R K Verma

- (2) A seismocity map of N W Kashmir was prepared and correlation to tectonics studied, by Dr R K S Chauhan
- (3) Dr R K S Chauhan has undertaken a small - scale seismic theory work for foundation studies
- (4) Electromagnetic model studies were continued by Dr M Poddar, and a new laboratory set up for small - scale model studies has started functioning

2.2.3 Electronics Commission project

Grant - in - aid for a project on the design and construction of a multi - frequency electromagnetic prospecting equipment (with Dr M Poddar as Principal Investigator) was sanctioned by the Electronics Commission Considerable progress was made during the short time available, and the transmitter unit (consisting of an inverter and a multi - turn air - cored coil) is ready for field tests

2.2.4 Development of expertise and facilities

- (a) With the help of the geophysical and electronic equipment available in the Department, expertise has been developed in the Geophysics Laboratory for undertaking the testing and repairs of geophysical instruments, such as resistivity meter, proton magnetometer, fluxgate magnetometer, seismic timer, electromagnetic prospecting unit, etc The Department has successfully repaired one resistivity meter and one seismic timer belonging to Groundwater Directorate of Bihar
- (b) An induction - logging experiment has been developed in order to illustrate the use of this method for the detection of conducting ore bodies

One Gamma - Ray Spectrometer (made by E C I L, Hyderabad) and one A C Resistivitymeter (mady by Sparkonics, Poona) have been procured

2.3 Research Publications

- (1) Verma R K, Mazumdar R, Ghosh D, Ghosh Ashish and Gupta N C (1976) : "Results of gravity survey over Raniganj Coalfield, India" (Geophysical Prospecting, 24 19 - 30)
- (2) Verma R K, Roy S K, Ghosh D and Agarwal B N P (1976) : "Results of gravity survey over some parts of Chhotanagpur in Bihar and West Bengal" (Symposium on Geoexploration in hard - rock areas, ISM, Mar 1976)

- (3) Verma R K and Ghosh D (1976) : "Gravity, Structure and tectonics of Gondwana basins of Damodar Valley, India" (Proceedings of seminar on Exploration Geophysics held at Osmania University, AEG, Hyderabad) (In press)
- (4) Verma R K Mukhopadhyay Manoj (1976) : "An analysis of gravity data of Lower Brahmaputra Valley and Garo - Rajmahal area, Eastern India" (Geophys Res Bull, 14 (1) : 7 - 14)
- (5) Verma R K, Mukhopadhyay Manoj and Ahluwalia M Sc (1976): "Earthquake mechanisms and tectonic features of Northern Burma" (Tectonophysics, 32 : 387 - 399)
- (6) Verma R K, Mukhopadhyay Manoj and Ahluwalia M S (1976) : "Seismicity, gravity and tectonics of Northeast India and Northern Burma" Bull. Seism, Soc Am, 66 (5) : 1683 - 1694)
- (7) Verma R K, Mukhopadhyay Manoj and Roy B N (1976) : "Seismicity of the Himalaya and Tibet, Implication of continental plate convergence" (The International Seminar on Himalayan Geology held at New Delhi, September, 1976)
- (8) Verma R K, Mukhopadhyay Manoj (1976) : "Tectonic significance of anomaly - elevation relationships in Northeastern India" (Tectonophysics, 34 : 117 - 133)
- (9) Verma R K, Mukhopadhyay Manoj and Roy B N (1977) : "Seismotectonics of the Himalaya and continental plate convergence" (Tectonophysics) (in press)
- (10) Verma R K, Mukhopadhyay Manoj, Roy S K and Sinha R P P (1977) : "An analysis of the gravity field over North-Singbhum, Bihar, Eastern India" (Tectonophysics) (in press)
- (11) Verma R K, Mukhopadhyay Manoj, Nag A K (1977) : "Seismicity and tectonics in South China and Burma" (Communicated to Tectonophysics)
- (12) Verma R K, Rao M K, Samadder A K and Bandopadhyay R R (1977) "Magnetic properties of ultramafic rocks near Nausahi chromite Mines, Orissa State" (Ind. J. Earth Sci, 4 (1) : 84 - 94)
- (13) Chouhan R K S, J Singh and V K Srivastava (1976) : "Focal mechanism studies and the Nepal aftershock sequence of Jun 27, 1966" (IJES, Calcutta, V 3, pp 229 - 233)
- (14) Srivastava V K, R K S Chouhan and R Nigam (1976): "Largest volume theory applied to probability of earthquake occurrence" (ISED, V 13, No 1, pp 9 - 23)

- (15) Srivastava V K, R K S Chouhan and J Singh (1977) : "Seismotectonics studies on Northwest Kashmir" (Sixth World Conference on Earthquake Engg, Jan 77, 483 - 484)
- (16) Rao M K, P K Roy and J Singh (1976) : "Paleomagnetism of a metanorite dyke of Hirapur, Dhanbad" (IJES) (in press)
- (17) Poddar M and R K Varma (1977) : "Results of some underground resistivity studies in Mosabani Copper Mines" (Seminar on "Exploration Geophysics" conducted by Association of Exploration Geophysicists, Osmania University, Hyderabad, Feb, 1977)
- (18) Poddar M (1977); "Some results of Electromagnetic model studies" (Seminar on "Exploration Geophysics" held at Osmania Univ, Hyderabad, Feb 1977)
- (19) B N P Agarwal and J Singh 1976 - A generalised method for various data processing techniques in gravity interpretation. Pure and Applied Geophysics, Vol 114, pp 975. 982
- (20) B N P Agarwal and J Singh, 1977 A comparative study of the shortening operators used in various data processing techniques in gravity field Geophysical Prospecting, Vol 25, 1 - 12

2.4 Ph D theses submitted and degrees awarded

- (1) A Ph D these on "Problems associated with transitional boundary in depth sounding by D C resistivity, magneto - telluric and electromagnetic methods" submitted by Shri K Mallick of NGRI was approved and the award of degree announced
- (2) Shri B N Satpathy working at NGRI/ISm, submitted a Ph D theses entitled "Geophysical Studies on ground water in different geological provinces in India", which was approved for the award

2.5 Consultancy projects

The following consultancy projects were undertaken by the department :

- (1) Geophysical investigations for location of faults/dykes in Jarangdih block of Bokaro coalfield - taken up for CMPDI
- (2) Estimation of sand thickness in some parts of Damodar river, Bokaro Coalfield - taken up for CMPDI
- (3) Groundwater investigations, for BCCL
- (4) Groundwater investigations, for Hindustan Malleables Ltd Jalan - nagar, Dhanbad

- (5) Groundwater investigations, for Dugda Coal Washery, HSL/BCCL
- (6) Groundwater investigations in Bhuli area of BCCL Colony
- (7) Groundwater investigations for Bihar State Housing Board

2.6 Special Short Course offered

A special course on "Solid Earth Geophysics" was organised by the Department during Jan, 17 - 29, 1977, as a part of the Golden Jubilee Celebrations of the School

Dr Hari Narain, Director, NGRI, Hyderabad inaugurated the Course, and special lectures delivered by several eminent geophysicists working in various parts of the country in different branches of Solid Earth Geophysics, including the following :

Dr Sarvjit Singh, Head, Deptt of Mathematics, University of Rohtak

Dr K L Kaila, Asstt Director, NGRI, Hyderabad

Dr T G Vergese, Head, Seismology Division, BARC, Bombay

Shri R S Chugh, Director, Geodetic & Research Division, Survey of India, Dehradun

Dr P N Agarwal, Associate Professor, Roorkee University

Dr B K Rastogi, Dr R U M Rao, Dr R N Singh and Dr Y V Ramana, Scientists, NGRI, Hyderabad

Prof V K Gaur, Prof of Geophysics, Roorkee University

Dr D R K Rao, Scientist, Institute of Geomagnetism Bombay

Prof R K Verma and Dr R K S Chouhan, ISM

The course was attended by 25 participants from various institutions within the country including Andhra University, Roorkee University, Survey of India, National Geophysical Research Institute and Indian School of Mines

The topics covered during the course included Seismicity studies in India and the Alpine belt, Thermal history of the earth and heat flow studies, Free oscillations of the earth, Measurement of strains and stresses along Himalayan belt, Radioactivity of rocks, High pressure techniques, Satellite geodesy, Electromagnetic phenomena, Origin of geomagnetic field, Micropulsations and magnetic field of the earth, Surface wave dispersion, Focal mechanism studies, Study of upper mantle structure from body waves.

2.7 Special lectures

As part of the Golden Jubilee Celebrations of the School special lectures as below were delivered in the Department :

- (1) Dr Hari Narain, Director, NGRI, Hyderabad, delivered a lecture on "Development of earth sciences in planning of natural resources" on Jan 17, 1977
- (2) Dr K L Kaila Asstt Director, NGRI, Hyderabad, delivered lectures on "Deep seismic sounding in the peninsular India and Himalaya" on Jan 24, 1977
- (3) Shri M R Nair Sr Geophysicist, GSI, delivered lectures on "Mining and Integrated Geophysics" on Feb 15 - 17, 1977
- (4) Dr V Schenk from Czechoslovakia Academy of Sciences, delivered a lecture on "Seismic phenomena near sources" on Feb 8, 1977
- (5) Dr Shivaji Dasgupta an ISM alumni working in USA, delivered a lecture on "Seismic Data Processing" on Feb, 1977

2.8 Participation in Seminars

The following scientists/teachers participated in various Seminars organised within the country :

- (1) Dr R K S Chouhan attended the VI World Conference on Earthquake Engineering held at New Delhi on Jan 10 - 15, 1977, and presented a paper on "Seismotectonics of north - west Kashmir"
- (2) Prof R K Verma and Dr R K S Chouhan attended the Seminar on "Himalyan Geology" organised by the Ministry of Mines, Government of India in New Delhi on Sept 13 - 15, 1977 and Prof R K Verma presented a paper on "Seismicity of Himalaya and Tibet and implications of continental plate convergence"
- (3) Dr R K S Chouhan attended seminar on "Modern developments in seismology", organised on January 9 - 10, 1977 at Roorkee Univ
- (4) Prof R K Verma Dr M Poddar and Dr M Mukopadhyay attended the seminar on "Exploration Geophysics in India, on Feb 26 - 28, 1977, at Osmania Univ, Hyderabad, organised by the Association of Exploration Geophysicists Dr M Poddar presented a paper on "Results of Electromagnetic model studies", and Dr M Poddar and Prof R K Verma a joint paper on "Results of some underground resistivity studies in Mosabani Copper Mine"

(24)

- (5) Shri G Prasad attended the Golden Jubilee Seminar on "Instrumentation and automation in mining industry", organised by the ISM Dep of Eng and Min Machinery, in Nov 1976
- (6) Shri B P Jha participated in the Golden Jubilee National Seminar on "Improved oil recovery techniques" organised by the ISM Department of Pet Engg in Nov 1976
- (7) All staff members of the Department participated in the Golden Jubilee National Seminar on "Precambrian Stratigraphy, tectonics and associated mineral deposits of India" organised by the ISM Department of Applied Geology, in Nov, 1976
- (8) All staff members of the Department attended the Golden Jubilee Interdisciplinary Seminar on "Mineral development in Eastern India" organised at ISM on December 5 - 7, 1976
- (9) Most of the staff members participated in the Workshop on "Grading and Internal Assessment" organised at ISM on Nov, 23 - 24, 1976

2.9 Membership of Senior staff on committees

- (a) Dr R K S Chouhan attended the ISI Map Sub-Committee meeting of the Geo-Seismological Investigations Panel, BDC-39; P2, in Mar, 1977 at New Delhi
- (b) Prof R K Verma acted as an expert member to the UPSC for the posts of Jr Geophysicist for Central Groundwater Board
- (c) Dr B N P Agarwal acted as Member of the Committee on Electronic Data Processing (EDP)

2.10 Training within India Abroad

- (1) Prof R K Verma went to Hungary and Czechoslovakia during May 1976 as a part of an exchange visit organised by the UGC, and visited several geophysical institutions in Hungary, including Eotvos Lorand Institute of Geophysics at Budapest, Geodetical and Geographical Research Institute, Hungarian Academy of Science at Sopron and Geophysical Institute of Czechoslovakian Academy of Science at Prague, Czechoslovakia. He delivered lectures on "Heat Flow and Gravity Studies in India" at these institutions
- (2) Dr R K S Chouhan returned in Aug, 1976 after 11 month training at the Cambridge University, England
- (3) Dr B N P Agarwal went on Post - doctoral Research Fellowship to Technological University, Delft, Holland in Sept, 1976

- (4) Shri V K Srivastava went on a Research Fellowship awarded by the U S Govt, to the University of St Louis and Lamont Geological Observatory, for higher studies in Geophysics, in Aug 1976
- (5) Dr M K Rao received training in Well Logging Operations and Interpretation Techniques with ONGC at Ahmedabad and Baroda, for a one - month period during Oct and Nov, 1976 under the QIP programme
- (6) Shri B P Jha went to the Atomic Minerals Division, Hyderabad for getting specialised training in the use of radioactive techniques, during Dec 1976 - Jan 1977
- (7) Shri G Prasad received training for about a fortnight at the CSIO Repair and Service Centre, Calcutta, during May, 1976
- (8) Dr M Mukhopadhyay attended a course on "Field Theory" organised by Osmania University, Hyderabad, during Mar 1 - 22, 1977

2.11 Distinctions and Awards

- (1) Prof R K Verma was elected Vice-President of the Indian Geophysical Union for 1976
- (2) Prof R K Verma was elected Fellow (as well as Member of the Executive) of the Association of Exploration Geophysicist Hyderabad

2.12 Purchase of Equipment

The Deptt purchased the following equipments during 1976-77

- (1) Gamma Ray Spectrometer, made by E C I L, Hyderabad. This is proposed to be used for the study of radioactivity of rock samples in the field
- (2) A C Resistivitymeter, made by Sparkonics, Poona

3 DEPARTMENT OF CHEMISTRY, FUEL AND METALLURGY

3.1 Academic and field activities

3.1.1 *New courses and syllabus revision*

(a) Prof R S Konar joined as Professor and Head of the Deptt on 21st May, 1976 but resigned his post and left on 31 3 1977 Prof T C Rao who joined on 17 3 1977 as Professor of Mineral Engineering took over as Head of the Department with effect from 1st Apr 1977

(b) A new Post - graduate DISM/M Tech programme on Coal/Mine - ral Preparation was started, with an intake of 6 including one sponsored student

(c) Some changes were made in the syllabus for I year II Semester, and for III year Pet Engg

(d) Some changes in the syllabus for Practicals were introduced for III year (Pet Engg) and IV year (Mining)

3.2 Research Activities

3.2.1 *Departmental programmes*

Research was carried out on the following projects :

- 1 "Desulphurization of Indian Coals" by different gases and chemicals, by N K Sinha, under the guidance on Shri J N Chakrabarti
- 2 "Activation of Coke" by S Das, under the guidance of Shri J N Chakrabarti
- 3 "Mixed Ligand Complexes and Corrosion Chemistry" by Dr S Mukherjee, under the guidance of Dr N S Rawat, Assistant Professor
- 4 "Corrosion Studies in Acid Mine Waters" by R K Gupta, under the guidance of Dr N S Rawat
- 5 "Spectrophotometric Studies of the First Row Transition Elements" by G Johri under the guidance of Dr N S Rawat
- 6 "Corrosion Studies in Acid Mine Waters" by G R Mohan, under the guidance of Dr N S Rawat
- 7 "Some Studies on the Redox Equilibrium of Some Colouring Oxides in Low Melting Glasses" by S Bandopadhyay, under the guidance of Dr P-K Gangopadhyay

8 "Characterization and Beneficiation of Coal Slurries of Central Coal Washeries" by Shri P Bandopadhyay

9 "Identification and Estimation of Minerals by DTA and TGA" (by Dr P K Gangopadhyay and Shri M L Gupta)

10 "Some Oxidants and their use in the Analysis of Ores, Minerals and Natural Products" by Shri S S Asthana

3.2.2 Inter - Departmental Programme

Work on a CMPDI project on "Desulphurization of Assam Coal by Bio - Chemical Method" continued to be done by Shri N K Prasad, Lecturer, under the supervision of Shri J N Chakrabarti, Assistant Professor, in collaboration with the I S M Department of Applied Geology

3.3 Publications

3.3.1 Research articles

The following articles were contributed from the Department :

- (1) J N Chakrabarti : "Potential Uses of Pulverized Fuel Ash in India" (Journal of Mines, Metals and Fuels, Mar 1977, pp 79 - 82)
- (2) J N Chakrabarti : "Prospects of manufacturing Iron and Steel in India without coking coal" (Metals and Minerals Review) (Communicated)
- (3) J N Chakrabarti and N K Sinha : "Effectiveness of gases in Desulphurization of Indian Coal" (under processing)
- (4) J N Chakrabarti and S Das : "Some studies on the Carboxy reactivity of Indian Cokes" (under processing)
- (5) J N Chakrabarti and N K Sinha : "Desulphurization and Recovery of Sulphur from Indian Coals by Air Oxidation at 3530 - 50°C" (under processing)
- (6) J N Chakrabarti : "Oxidation parameters of Bituminous coal - part I" (under processing)
- (7) Dr N S Rawat : "Determination of Total Sulphur in some Indian Coals by Oxidising Acid Mixture of Potassium Permanganate and Peroxy Monophosphoric acid" (Chemistry and Industry, London, Sept 4, 1976, pp 743 - 44)
- (8) Dr N S Rawat : "A study of ancient Copper and Bronzes and their Corrosion products" (Transactions of Indian Institute of Metals, Vol 29, No 4, Aug 1976, pp 254 - 261)

- (9) Dr N S Rawat and S Mukherjee : "Bivalent Metal chelates of paminobenzoyl glycine," (Journ Indian Chem Soc)
- (10) Dr N S Rawat and S Mukherjee : "Stabiliy Constants of rhoxizonic acid complexes in solution", (Acte Chemimica/Hungary) (Communicated)
- (11) Dr N S Rawat, D J Phillips, and S K Tiwari : "Mixed Metal Complexes with the Binucleating Schiff Base of 3 - Formly - 2 - hydroxybensoic acid and 1,2 - Diaminopropane" (J Inorg Nucl Chem 39, 797, 1977)
- (12) Dr D Guha : "Studies on the Electrical and Catalytic Proparities of Vanadium Pentoxide and Vanadium Bronzes" (Ph D theses, I I T Bombay, 1976)
- (13) Dr D Guha, D K Chakrabarty and A B Biswas : "Electrical Properties of Vanadium Pentoxide Doped with Lithium and Sodium in the L - Phase Range" (Jour Materials Sci, Vol II, pp 1347 - 1353, 1976)
- (14) Dr D Guha, D K Chakrabarty, I K Bhatnagar and A K Biswas : "Dehydration of Isopropyl Alcohol on Lithium Vanadium Bronzes : The Relation Between Electrieal and Catalytic Properties" (Jour Catalysis Vol 45, pp 305 - 309, 1976)
- (15) Dr D Guha and D K Chakrabarty : "Catalytic Properties of the Vanadium Bronzes : I Decomposition of Isopropanol" (Communicated to Kineties and Catalysis Letter, U S S R)
- (16) Dr D Guha, D K Chakrabarty and A B Biswas : "Solid State Properties and Catalytic Behaviour of the Land B Vanadium Bronzes" (Communicated)
- (17) Dr Guha : "Coal Beneficiation by Eelectrostatic and High Tension Methods" (Communicated)
- (18) Dr P K Gangopadhyay : "Low Temperature Viscosity of Na 2 • - Geo 2 gasses" (Commnnicated to American Ceramic Society)
- (19) Shri P Bandopadhyay : "Corrosion and its prevention in Mining Industry" (Jour of Mines Metals and Fuels, Dec 1976)
- (20) Shri P Bandopadhyay and A K Ghosh : "Quality of coal for Integrated Iron and Steel Plants" (Communicated)
- (21) Shri S S Asthana and E B Singh : Determination of Phosphorus in Organic Substances by Wet Combustion Technique Using Nitric acid and Potassium Chlorate" (Chemistry and Industry, Lond Vol 21, pp 952-954, 1976)

3.3.2 Book Writing

On the invitation of the U S Energy Research and Development Administration, Shri J N Chakrabarty, Asstt Professor, has contributed two chapters in their forthcoming publication "Analytical Methods for Coal and Coke products" to be published by Academic Press Inc, New York. The chapters are entitled "Methods of determining chlorine in different status of combination in Coal" and "Analytical Procedures for Sulphur in Coal Desulphurization Products"

3.4 Consultancy Projects :

The following consultancy projects were handled :

- (1) "Upgradation of Quartzite Gravel from Kuwait" for Engineering projects (India)
- (2) "Study of Pozzolana clay" for West Bengal Mineral Development and Trading Corporation Ltd

3.5 Testing services :

The Department took upon the task of carrying out Mine Air Analysis and Mine Dust Analysis for the coal industry, formerly being carried out at C M R S/Dhanbad : Shri M L Gupta and Shri N K Prasad, Lecturers, are in charge of this activity

3.6 Guest Lectures

- (1) Shri G G Sarkar, Dy Director, C F R I, delivered a lecture on "Some Glimpses of the world wide trends in coal preparation" in coal preparation" in the I S M Golden Jubilee lecture series

3.7 Field trips and Training Programmes

The following field trips were arranged :

- (1) Sindri Fertilizer Corporation, Sindri - I year
- (2) Hinduathan Zinc Ltd, Tundoo - II year
- (3) Indian Iron & Steel Co. - III year Mining
- (4) Bararee Coke Oven Plant - III year Mining
- (5) Maithon Refractories, Maithon - IV year Mining
- (6) Prtherdih Coal Washery - V year Mining & DISM/M Tech
- (7) Jamadoba Coal Washery - V year Mining & DISM/Mech
- (8) Mc Nally Bharat Engg, Kumardhubi - V year Mining & DISM/M Tech
- (9) Kathara Coal Washery - DISM/M Tech

An outstation tour arranged for IV year Mining to Calcutta covered visits to Ananda Bazar Patrika Press, Macneil Magor Ltd, National Test House/Alipore, Birla Industrial & Technological Museum, Indian Aluminium Corporation/Belur and Dunlop India Limited/Sodepur.

3.8. Attendance/Participation in Seminars, Conferences, Workshops

3.8.1 *Shri J N Chakrabarti*

(a) Attended the 64th session of Indian Science Congress held at Bhubaneswar on Jan 3 - 8, 1977, and presented a paper "Effectiveness of gases in Desulphurization Indian Coals" jointly with N K Sinha, and another paper "Studies on the Carboxy - reactivity of Indian Cokes" Jointly with S Das

(b) Participated Golden Jubilee National Seminar on "Improved Oil Recovery Techniques" organised by the I S M Department of Petroleum Engg on Dec 27-29, 1976

(c) Participated in the Golden Jubilee Interdisciplinary Saminar on "Mineral Development in Eastern India" organised at I S M on Dec 5-6, 1976, and presented a paper on "A System Approach For Our Energy Problem"

(d) Delivered two lectures on "Selective Preparation of Coal for Carbon - Zafim" on Jul 23, 1976 at a course organised by Coal India Ltd for its executives

Dr N S Rawat :

(a) Participated in the Annual Convention of Indian Chemical Society held at Bangalore University on Dec 13-18, 1976 and presented a paper on "Potentiometric Studies on metal complexes of Tartronic acid, P - Aminohippuric acid and Rhodizonic acid", Jointly with S Mukherjee

(b) Attended the International Symposium on "Industrial Electrochemistry" held at IIT Madras on Dec 17-21, 1976.

(c) Attended the 64th session of the Indian Science Congress at Bhubaneswar on Jan 3-8, 1977, and presented a paper "Stability Constants of rhodizonic acid complexes in solution" jointly with S Mukherjee

Shri S V B Subbarao

(a) Attended the Golden Jubilee Inter - disciplinary Seminar on "Mineral Development in Eastern India" held at I S M in Dec 1976 and presented a paper on "Beneficiation of Low grade deposits" jointly with P P. Pandopadhyay, and J Mandal

(b) Attended the Golden Jubilee National Seminar on "Instrumentation and Automation in the Mining Industry" held at I S M on Nov 8-9, 1976

(c) Participated in National Seminar on "Optimum Utilization of Plan and Equipment in the Mining Industry" organised by the Bureau of Public Enterprises at Bhavan, New Delhi on Feb 9-11, 1977

Dr Dipak Guha :

(a) Attended the II National Symposium on Catalysis, Indian Institute of Petroleum, Dehradun, 1977 and presented a paper on "Solid State properties and Catalytic Behaviour of the L - and B - Vandium Bronzes" jointly with D K Chakrabarty and A B Biswas

(b) Attended the Symposium on "Frontiers of materials Research" held at IIT Kanpur, 1977, and presented a paper on "Electrostatic and High Tension Separation of Mixed Granular Solids : I Coal Beneficiation".

(c) Attended the IX Annual Convention of Agri - Chemists held at Bangalore, Dec 11-15, 1976, and presented a paper on "Studies on the Flow Properties of Sodium Bentonite Suspensions in presence of Electrolyte Solutions and Humic Acids".

Dr P K Gangopadhyay

Attended the Scientists - Industry Get - Together on Refractories, Glass and Ceramic Industries in Bihar organised at the National Metallurgical Laboratory, Jamshedpur on Feb, 12 1977, by the Govt of Bihar

Shri P Bandopadhyay :

(a) Attended the 30th Annual Technical Meeting of Indian Institute of Metals held at Poona on Nov 14-17, 1976, and presented a paper on "Corrosion of Austenitic Stainless Steel in Polythionic Acid"

(b) Attended the Golden Jubilee Inter - disciplinary seminar on "Mineral Development in Eastern India" held at I S M in Dec, 1976 and presented a paper jointly with Shri S V B Subbarao and Shri J Mandal

(c) Attended the Seminar on "Quality Teaching in I S M" organised by the I S M Teachers Association

Shri S S Asthana :

(a) Attended the Annual Convention of Chemists held at Bangalore University on Dec 11-15, 1976 and presented a paper on "Determination

of Phosphorus in Organic Substances by HNO_3 and KClO_3 ".

(b) Attended the 64th Session of Indian Science Congress held at Bhubaneswar from Jan 3-7, 1977, and presented a paper on "Determination of Phosphorus by wet Oxidation Techniques"

3.8.2 Conference organised if any :

(1) A 3-week intensive course on Fuel Efficiency Engineering was organised on May 10-29, 1976. Participants included teachers and engineers from different organisations like Railway Training Institute/Jamalpur, BCCL, FCI, Bokaro and Bhilai Steel Plants.

(2) The Second Short - term course in Coal preparation was organised on Oct 11-23, 1976. Amongst the guest lectures who participated were Shri G G Sarkar, (Dy Director), Shri A K Chakrabarti, (Asstt Director), Shri M N Bose, (Scientist) and Shri S N Sakha (Scientist) of C F R I; Shri I Trinadham and Shri M N Sharma of C C W O.

Dr K Sen of B C C L, Dr S M M Safvi, Chief Engineer (Washeries) of TISCO, Shri Asa Singh, Chief of Corporate Planning, C I L, and Shri L Prasad, Dy Chief Project Engineer of T M F.

3.9 Membership of Staff on Committees :

Shri J N Chakrabarti, Assistant Professor, was elected a member of the Selection Committee for the Section of Engineering Sciences, Indian Science Congress for 1976 - 77. He was a member of this Sectional Committee for 1974 - 75 and 1975-76.

3.10 Training within India and abroad :

(1) Shree J N Chakrabarti, Assistant Professor, was deputed in Jan 1977 to the Academy of Mining & Metallurgy, KRAKOW, Poland for a four - week study visit under the Indo - Policy cultural Exchange Scheme. He delivered a lecture at the Academy on the research work being carried out at I S M. During this visit, Shri Chakrabarti was attached to the Institute of Energo - Chemistry of coal and Sorbent Chemistry of the Academy.

(2) Dr N S Rawat, Assistant Professor, attended a Q I P Course on "Energy Resources, Technologies and Energy Systems" held at the Indian Institute of Science, Bangalore on Jan 14 - 29, 1977.

(3) Dr D Guha, Lecturer, attended a QIP Course on Industrial Catalysis and High Pressure Technology" held at ITT/Madrass in 1976.

(4) Dr P K Gangopadhyay, Lecturer, attended a QIP Course on "Engineering materials and their selection" held at Roorkee University on Jun 13 - Jul 10, 1976.

(5) Shri N K Prasad, Lecturer, attended a one-month QIP Course on "Reaction Engineering" held at Roorkee University in Jun - Jul, 1976.

3.11 Purchase of equipment etc.

(1) The Mineral Dressing Laboratory shifted to a new building specially designed to house the full range of equipment needed for teaching research and testing in the field of mineral and coal beneficiation.

(2) The following equipments were purchased for the Fuel Laboratory :

- : Giesler Plastometer
- : HGI - Mill
- : Micum Index apparatus for coke
- : Carbon - Hydrogen apparatus
- : Apparatus for determining the crossing point of coal
- : Adiabatic Bomb Calorimeter.

4. DEPARTMENT OF ENGINEERING & MINING MACHINERY

4.1 Academic and Field Activities :

4.1.1 Changes made in Syllabi :

At a meeting of Board of Courses and Studies for the Department of Engg & Mine Machinery, held on 28/6/77, the syllabus and examination Scheme for the 3 - Year Condensed Course in Mining Machinery was approved. The programme offering will start next year.

4.1.2 Field Trips and training arranged :

(a) Educational visits to different opencast mines at Kusunda, Rajapur, Noamundi were arranged for M Tech (Open-cast) students, under the guidance of Prof K R M Rao, Dr C Sahay and Shri B K Verma.

(b) A visit to the Computer Centre, CMERI; Durgapur, was arranged for M Tech (Mining Machinery) students, for training in card punching and feeding.

(c) A large number of visits to mines in the Jharia and Raniganj coalfields and a visit to the CCL, Central Workshop, Barkakhanā, were arranged for the students of the one - year Postgraduate (Sandwich) Course in Coal Mining Machinery. Visits for this group were also arranged to mining - machinery manufacturers like MAMC, McNally Bharat Engg Ltd., Tata - Robins - Frasers, and Usha - Martin - Black.

(d) A Visit to B C C L Rope Ways and the Compressor Plant of F C I/Sindri was arranged for IV year (Mining) students, under the guidance of Prof S K Gupta and Shri A K Basu.

(e) A visit to F C I was arranged for IV and V year (Pet) students, under the guidance of Prof C R C Rao

(f) A visit to the Drilling Rigs and Cranes section of HEC/Ranchi was arranged for III and IV year (Pet) students.

In addition, the practical training spells for the one - year postgraduate (sandwich) Course in Coal Mining Machinery students, arranged in different B C C L collieries, were supervised.

4.2 Workshop activities :

The year 1976-77 was a period of hectic activities for the Workshop. Apart from the normal maintenance and repair work (maintenance of the various machineries and equipment of the institution,

maintenance of the 13 school vehicles and of the telephonic and other service equipment, attending to various breakdowns, routine repairs and maintenance of institution furniture), the following fabrication jobs were handled by the Workshop during the Golden Jubilee year :

Sl. No.	Description of Job	Department
1.	Design and fabrication of a working model of 100/150 HP direct haulage for Golden Jubilee exhibition. (Scale 1/20 full - size)	Engg & Min Machinery
2.	Design and fabrication of a Coal grinding machine, including procurement of materials.	Min Engg
3.	Fabrication of a tape extension meter	—do—
4.	Fabrication of flow-visualising model with stand	—do—
5.	Complete fabrication of equivalent material model study bench (for an R & D project)	—do—
6.	Improvising of the moving table of a coal cutter (saw cutter)	—do—
7.	Fabrication of a flow detector for mine ropes (an Electronic Commission research project)	Physics and Maths/Engg and Min Machinery
8.	Fabrication of a high - pressure stainless steel vessel to with stand 1000 P S I all units of the vessel and assembly (for an R & D project)	Pet Engg

These are besides more then 300 job requisitions from the various departments of the institution.

The Workshop also supervised the following major jobs :

- (1) Installation of the 2nd automatic telephone exchange.
- (2) Errection of stalls, pandals, stages, etc, for the Golden Jubilee Book Fair and Exhibition (including electrification of structures).
- (3) Shifting and re-installing equipment of the Mineral Dressing Laboratory in the new building (comprising of civil, mechanical and electrical jobs)

4.3 Research Activities and Publications :

4.3.1 - Research projects completed

- (a) Design and fabrication of prototype shaft-signalling system for Mines (Prof K R M RAO and Shri D K MITTRA)
- (b) Design and Development of under-frequency relays (Shri S RANGACHARI and Dr K R M RAO)

4.3.2 Research projects in progress

- (i) Design and fabrication of fully solid-state contractor-less drill panel (One Junior Research Fellow is working under the guidance of Shri D K Mittra, Asstt Professor)
- (ii) Dynamic braking of induction motors for mine winder applications. (A CSIR Junior Research Fellow is working with Prof K R M Rao)
- (iii) An investigation of cultability of Indian Coals. (Dr C Sahay Asstt Professor)

4.3.3 Other departmental research projects

In addition to continuing work on the earlier research projects, new projects were taken up on thyristor controllers for motors, transportation systems in mines, cultability of coal, etc.

4.3.4 Inter-departmental research projects

- (i) Work on the Electronics Commission project on 'Development of a Defectoscope for non-destructive testing of Wire Ropes' is in progress in collaboration with Shri Dinesh Chandra of the Deptt of Physics and Mathematics.
- (ii) Work on the development of Mathematical Models for Material Handling Systems, has been taken up in collaboration with the Department of Ind Engg and Management
- (iii) Work on Hydraulic Transport of Solids in Pipe-lines, is expected to be taken up in collaboration with the Deptt of Min Engineering.

4.4 Publications :

- (1) K R M Rao : "Progress in Electrification, Automation and Remote control in Mining Industry". (N P C Seminar on maintenance on Mining Machinery New Delhi, Nov 2-4, 1976)
- (2) K R M Rao : "Remote-control circuits for Face Machinery in Coal Mines". (I S M Golden Jubilee National Seminar on "Automation and Instrumentation in Mines", Dhanbad, Nov 8-9, 1976)

(37)

- (3) K R M Rao, S K Gupta, A Chatterjee, A K Basu : "Development of Min Machinery in India, its present status - future". (Bureau of Public enterprise seminar on 'Optimum utilization of Equipment in Mines, New Delhi, Feb 9 11 1977)
- (4) C R C Rao : "Armoured Face Conveyors - Safety aspects and testing". (N P C Seminar on 'Maintenance of Min Machinery', New Delhi, Nov 2-4, 1976)
- (5) D K Mittra, Dinesh Chandra, "Electromagnetic flaw detector for mine winder ropes" (World Instrumentation Symposium New Delhi, Dec 1976)
- (6) C Sahay : "Maintenance of compressed air System" (Colloquium on Maintenance of Mining Machinery" organised by Institution of Engineers (India, Dhanbad Sub-Centre, I S M/Dhanbad June 4, 1977)
- (7) C Sahay : "What to teach and what not to teach-some considerations". Golden Jubilee ISM Teacher Association Seminar on ' Quality Teaching at ISM', April 1977)
- (8) A Chatterjee : "Indigeneous development of FLP diesel locomotive - A challenge to designers". (I E seminar on "Transport in Bihar Coal fields", Dhanbad, March, 1977)
- (9) A K Basu : "Elevated temperature machining of non-hard Martensit white cast iron" (All India Machine Tool Design and Research Conference, 1976)

4.5 Guest lecturers

The following invitation lectures were organised during the year.:

- | | | |
|-----|---|---|
| (a) | Dr B P Sinha
Prof and Head
Civil Engg Department
BIT, Sindri | Foundations
(Jul 1976) |
| (b) | Shri B A Chetty
Scientist
C M R S | Intrinsically safe
apparatus
(Jul 1976) |
| (c) | Shri P Banerjee
Su dt Engineer
B. C L. | Mine structures
(Aug 1976) |
| (d) | Prof P V Ganesan
Professor
Indian Institute of
Management
Bangalore | Maintenance
management
(Nov 1976) |

- | | | |
|-----|---|--|
| (e) | Shri D N Bagchi
Retired Jt Dir of Mines Safety
(Elec) | Insulation of electric
systems
(Nov 1976) |
| (f) | Shri R K Sarkar
Manager (Inspection)
TISCO Collieries
Jamadoba | Colliery Workshops
(Jan 1977) |
| (g) | Shri S K Biswas Gupta
Joint Director of
Mines Safety (Elec) | Indian Electricity
Rules as applied to
Mines
(Jan 1977) |
| (h) | Shri N K Sen
Joint Director of
Mine Safety (Elec) | Flameproof Equipment
for coal mines
(Jan 1977) |
| (i) | Shri B N Dixit
Supdt. Engineer (Excavation)
B C C L | Maintenance of
excavators
(June 1977) |
| (j) | A Murty
Sr Engineer (Excavation)
B C C L | Dumpers
in opencast mines
(June 1977) |

4.6.1 Conference organised

The Department organised an all India Seminar on "Automation and Instrumentation in Mining Industry" during Nov 8 - 9, 1976 as part of the I S M Goldon Jubilee Celebrations. Shri D K Mitra, Asstt Prof. was the Seminar Convenor.

4.6.2 Short courses organised

The Department organised the following short course during the year

- | | | | |
|----|-----------|-------------------|--------------------------|
| 1. | Aug 1976 | Mine Winders | ECL/Ukhra Area |
| 2. | Sept 1976 | Mining Machinery | One-week Incampus course |
| 3. | Oct 1976 | Mine Winders | ECL/Satgram Area |
| 4. | | Material Handling | Two-week Incampus course |

4.6.3 Special lectures delivered by Departmental staff :

Members of the Departmental staff delivered the following lectures in other programmes ;

(39)

Name	Topic	Location
1. Prof S K Gupta	Transportation systems in mines	Short-course on mining Technology (organised by Deptt of Min Engg) Jun 1977.
2. Prof C R C Rao	(a) Winding in mines	PG students/BIT Sindri, Mar 1976.
	(b) Tribology	Group of BCCL engineers, Dec 1976
3. Dr C Sahay	Method study	Short-course in Productivity Technique in Mining Industry (organised by Deptt of Ind Engg & Mgmt Dec 1976.
4. Shri A Chatterjee	Planned layout of mining machinery	Short course in Productivity Technique in Mining Industry, (organised by Deptt of Ind Engg & Mgmt) Dec 1976.
5. Shri A K Basu	Equipment for material handling/crushing/grinding	Short-course in Coal Preparation (organised by the Deptt of Chemistry, Fuels and Metallurgy) Oct 1976.

4.7 Attendance/Participation in Seminars, Conferences

(1) *Dr K R M Rao* participated in the following :

(a) N P C Workshop on Maintenance of Mining Machinery, Calcutta, Nov 1976

(b) I S M Golden Jubilee National Seminar on 'Instrumentation and Automation in Mining Industry', Dhanbad, Nov 1976

(c) I S M Golden Jubilee International Symposium on "Thick Seam Mining, Dhanbad, Mar 1977

(d) B P E Seminar on 'Optimum utilization of Equipment in Mines', New Delhi, Feb 1977

(e) I E Seminar on 'Transportation in Bihar Coal Fields' C M R S, Dhanbad, Mar, 1977

(2) *Prof S K Gupta* attended the B P E Seminar on 'Optimum Utilization of Equipment in Mines', New Delhi, Feb 1977

(40)

- (3) *Prof C R C Rao* attended the first meeting of the Organising Committee on 'Tribology in Mines Seminar' at New Delhi in Jan 1977
- (4) *Shri D K Mittra* attended the World Instrumentation Symposium, New Delhi, Dec 1976
- (5) *Dr C Sahay* attended on the NPC Seminar on 'Maintenance of Mining Machinery', I S M/Dhanbad, June 1977
- (6) *Shri B K Verma* attended the I S M Golden Jubilee Seminar on Secondary Oil Recovery Techniques', Dhanbad Nov 1976
- (7) *Shri B K Verma* attended the short course on 'Mining for Non - mining Executives' at I S M, Dec 1976
- (8) *Shri A Chatterjee* attended the following seminars :
 - (a) I S M Workshop on 'Grading and Internal Assessment. Dhanbad, Nov 23 - 24 1977
 - (b) ASCI Workshop on Management and Monitoring of Research Projects, I S M/Dhanbad Jan 14 - 16, 1977
 - (c) I S M Golden Jubilee National Seminar on Instrumentation and automation in Mining Industry, Dhanbad, Nov 1976
- (9) *Shri A K Basu* and *Shri A C Tiwari* attended the Winter School on 'Industrial Hydraulics and Pneumatics', Jadavpur University Engg College, Jan 1977
- (10) *Shri A C Tiwari* attended the IPMA Seminar on 'Pumping', Bombay, Nov 1976

4.8 Membership on committee, etc.

- (1) *Dr K R M Rao* was appointed member of the Working Group on 'Control and Industrial Electronics' set up by the Panel on 'Mining Electronics and Telecommunication' of the Electronics Commission
- (2) *Shri Dinesh Chandra* was appointed member of the Working Group on 'Manpower and training' set up by the said Electronics Commission Panel
- (3) *Dr C Sahay*, Asstt Prof in Mech. Engg, was awarded the Ph D degree of IIT/Delhi, in 1976, on submission of a theses on the "Dynamics of Discontinuous Chip Formation in Orthogonal Metal Cutting"

4.9 Training within India and Abroad :

- (1). As part of Indo - Polish Cultural Exchange programme (1975/76), *Shri D K Mittra* and *Prof K R M Rao* visited the Academy of Mining and Metallurgy, Krakow, Poland in Feb/Mar, 1977 for a period of 3 weeks and 2 weeks respectively. *Prof Rao* also visited coal mines in

Poland, Germany and France to study the modern developments in Min Machinery

(2) Dr C Sahay took practical training at HEML Kolar for a period of two weeks in Sep 1976 and for one week at HMBP Ranchi, from Dec 26, 1976

4.10 Purchase of Equipment :

The following items of equipment were purchased during the year :

- (1) "Electromag" - make 4 - step 6 - cam master controller and 200 mm dia thruster operated brake, with 18 kg thruster
- (2) Slipring induction motor 3 ph. 400/440V, 50 c/s, 5 HP, 4 poles, Pioneer make.
- (3) Blowe Testing equipment with accessories.
- (4) OCE-206 Deluxe semi-dry process combined synchronised printing & developing machine, with accessories
- (5) Air compressor rig, with accessories
- (6) A model of Dumper
- (7) Hygrodyne Tensometer with attachment
- (8) Electronic desk - calculator - 1042 s
- (9) Protable moving - iron voltmeter (range 0 - 75 - 150 - 300 V & 0 - 300 - 600 V)
- (10) Triple - pole air - break contactor rated 75 A
- (11) 0 - 10/20 AC/DC moving - iron ameter dual - range wattmeter 10/20 A voltage (range 62.5/125/250/500 V, 1200 wts)
- (12) AC Generator
- (13) Dynamic Balancing Machine Model EL - 10



5 DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCE

5.1 Academic activities

The syllabi of different courses taught by the Department, in the disciplines of Economics, Political Science, Public Administration, Industrial Psychology and English were revised by different syllabus committees formed by the Director on the basis of a decision of the Academic council. Besides the Departments' own faculty members, experts in different disciplines from other universities/institutions were associated with these committees

5.2 Research activities/Publications :

All Departmental staff members are engaged in their individual research projects as below :

- (1) Shri D P Jha on "Problems of public enterprises with special reference to B C C L"
- (2) Shri S K Basu on "Sarvodaya and Communism"
- (3) Shri R K Singh on "Savitri : A Spiritual Epic"

5.3 Guest Lecturers

Guest lecturers from different universities were invited to deliver extension lectures as below :

- (1) Dr Damodar Thakur, Central Institute of English and Foreign Languages/Shillong, and Shri B K Das of C I E F L/Hyderabad, delivered lectures on 'Note taking and Technical English'
- (2) Dr Kamta Prasad, Member, Floods Commission, Govt of India, delivered lectures "Formulation and Appraisal of Industrial Projects"
- (3) Prof S K R Bhandari, B H U Department of Management Studies, delivered a lecture on "Public Enterprises"

5.4 Attendance/participation in seminars, conferences, workshops

- (1) All staff members of the Dept attended a workshop on "Grading, Internal Assessment and Restructuring of Papers", organised at I S M on Nov 23/24, 1976
- (2) Shri R K Singh, Lecturer, attended the 5 - week U G C - C I E F L summer Institute in English held in Shillong in May - Jun, 1976
- (3) Shri R K Singh attended the U G C - C I E F L Summer Institute follow - up course held in Shillong on Dec 6 - 13, 1976
- (4) Shri S K Basu, Lecturer, attended the English Teachers' Conference held in Bombay on Dec 28 - 30, 1976

(43)

(5) Shri R B Paswan, L D C of the Department, attended the Library Training course organised in the I S M Library on Jun 8/9, 1977

5.5 Purchase of equipment

An amplifier and some linguaphone records/tapes were purchased as audio - visual teaching aids in the Department



6 DEPARTMENT OF INDUSTRIAL ENGINEERING & MANAGEMENT

Some highlights

This new Department, started on 1. 1. 1976 with just one staff member acquired two more during the year and made a good start in meeting its specified objectives of offering management courses as applied to the mineral industries. The feed back received from the courses that it has run so far indicate that there is a definite need for a regular postgraduate programme in Industrial Management as applied to mineral industries.

6.1 Academic & Field Activities :

6.1.1 The Department designed and organised the following three 3 - month postgraduate Certificate Courses :

Course	Lect - hrs per week taken by the Deptt	* Field-trips
Mine Management & Safety	10	5
Productivity Techniques	24	4
		(Plus 10 days field work on Projects)
Project Management	24	2

* Guided field trips were arranged to different mines, planning deptts of mining enterprises, construction & reconstruction projects and Computer Centres at FCI/Sindri and CMERI/Durgapur.

6.1.2 The Deptt took an about 11 hours per week of teaching load for students of the PG (BCCL) Coal Mining Machinery Course, the part - time M Tech (Mining Machinery) programme, the revised M Tech (Opencast Mining) programme and the DISM/M Tech programme in Mineral preparation.

6.1.3 The Deptt also organised 4 one - week intensive courses in Computer Programming for several batches of I S M postgraduate students

6.2 Research Activities :

6.2.1 With the objective of developing case - studies and application of applied industrial techniques, the faculty have been engaged in different types of research investigation in the following fields :

(1) Development, documentation & follow - up of standard of operations in mines, with the aim of establishing a computerised data bank. The study has been carried out in two mines each of BCCL and ECL

(2) Developing production and planning system models, and solution methodology for individual mines and rationalising management planning and control system. One case has already been developed

(3) Evolving algorithms of integrated system models for a group of mines. Some cases are being processed at the Computer Centre of CMERI/Durgapur

6.2.2 Student Projects/Seminars

Seminars on the following topics were given by the participants of the three CISM Courses on Mine Management, Productivity Techniques and Mine Project Management :

- (1) Organisational Design and Development in Mining Enterprises
- (2) Management by Objectives : Functioning of MBO at Area and Colliery level
- (3) Planning for higher productivity in Mines
- (4) Design of Wage Incentive Plans for Mines
- (5) Work study - Appraisal of the Techniques
- (6) Applications of Work Study in Production Planning & Control
- (7) Network Methods for project and Operational Planning in Mines
- (8) Linear programming and its application to Mining
- (9) Cost Analysis and Cost Control in a Colliery
- (10) Productivity Studies at a Colliery of BCCL
- (11) Equipment Utilisation Study at Kusunda Opencast Project
- (12) Determining the Optimal Capacity of Lachipur Colliery (ECL) and assessing the break even points
- (13) Cost Analysis & Optimisation of Transport Sub-system at Sripur Colliery (ECL)
- (14) Action Programme of a Reconstruction Project (ECL) through Network Analysis
- (15) Maintenance Planning by Simulation Models - a Case study
- (16) Application of some Analytical Techniques in an Underground Reconstruction Project (BCCL)

6.3 Publications

- (1) Sinha D K & Rao K R M : "Problems of machinery maintenance in underground mines". (NPC Seminar, Calcutta, Jul 1976)
- (2) Sinha D K & Sharma R N : "Total Systems Planning for Coal Production in India". (International Symposium on O R & Computer applications to the Mineral Industry, Penisylvania State University, U S A, Oct 1976)
- (3) Sinha D K : "Equipment Replacement Policies in existing mines - A suggestion" (NPC Regional Seminar on Maintenance of Mining Machinery, Calcutta, Sep 1976)
- (4) Sinha D K : "Automatisation of Management Information Systems in underground Coal Mines". (ISM Golden Jubilee National Seminar on Instrumentation and Automation for the Mineral Industry, Dhanbad, Nov 1976)
- (5) Sinha D K : "Productivity - its meaning to the Individual, the Organisation and Nation". (Productivity Seminar organised by the Indian National Mine Workers Federation, Ranchi, Dec 1976)
- (6) Sinha D K : "System Planning for exploitation and beneficiation of Coal in Eastern India". (ISM Golden Jubilee Inter - disciplinary Seminar on "Mineral Development in Eastern India, Dhanbad, Dec 1976)
- (7) Sinha D K : "Developing Optimal Mechanisation Scheme for Coal Mines in India". (Seminar on "Optimum Utilisation of Plant & Equipment in Mining Sector" organised by the BPE, New Delhi, Feb 1977)

6.4 Short Courses Offered

A one - week course on "Orientation to Productivity Techniques" was offered for Senior Executives during 12 - 18, 1976

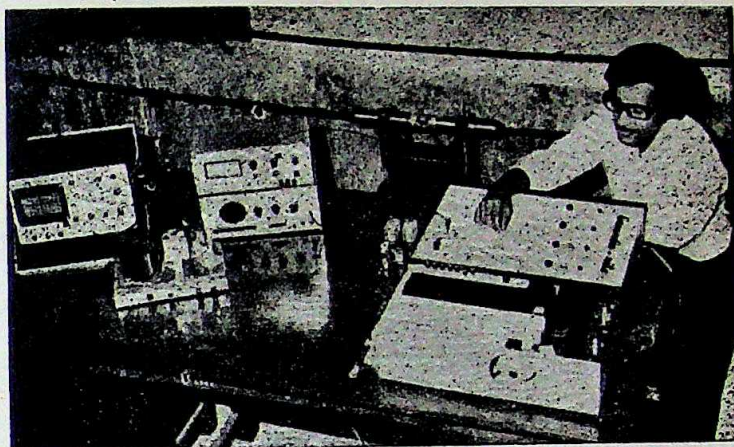
6.5 Consultancy Projects

The following projects were taken up :

- (1) Production System Optimisation and Rationalisation in East Katras Colliery for BCCL - Project completed
- (2) Organising the Industrial Engineering Department of ECL - Project in progress

6.6 Guest Lecture

Guest lectures for the three PG Certificate Courses were arranged from several organisations like CIL, BCCL, ECL, IIT / Kharagpur, NPC/Calcutta, IIM/Bangalore, IIM/Calcutta, XLRI/Jamshedpur

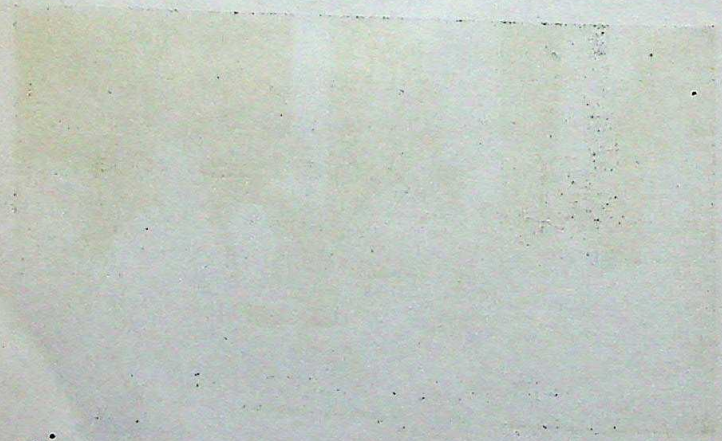


Electro-Magnetic Flaw Detector for Mine Ropes.

SEMINAR ON MINERAL DEVELOPMENT IN EASTERN INDIA



From L to R : Prof G S Marwaha, Prof D K Sinha,
Dr Jagannath Mishra (Chief Minister), Shri R N Sharma
and Shri Bindeswary Dubay (Health Minister)



6.7 Training

- (1) Prof D K Singh attended a short course on "Management Information System" organised by the Institute of Chartered Accountants (India), Darjeeling, Jun 4 - 7, 1976
- (2) Shri M S Cheema attended a 2 - week short course on 'Personnel Administration and Industrial Relation' at NITIE/Bombay, Jan 24 - Feb 4, 1977

6.8 Participation in Seminars, Conference, Workshops

Prof D K Sinha

- (a) NPC Seminar on Maintenance, Calcutta, Jul 1976
- (b) NPC Regional Seminar on Maintenance of Mining Machinery. Sep 1976
- (c) ISM Golden Jubilee National Seminar on Instrumentation and Automation, Dhanbad, Nov 1976
- (d) ISM Golden Jubilee Interdisciplinary Semiear on Mineral Development in Eastern India, Dhanbad, Dec 5 - 6, 1976
- (e) Seminar on 'Productivity in ihe Mining Industry' organised by Indian National Mineworker's Federation, Ranchi, Dec 12 1976
- (f) ASCI Workshop on 'Management and coordination of Research', ISM/Dhanbad, Jan 14 - 16, 1977
- (g) Seminar on 'Optimum Utilization of Plant & Equipment in the Mining Industry', jointly sponsored by BPE, MMGI, IE (India) & IIME, New Delhi, Feb 9 - 11, 1977
- (h) ISM Golden Jubilee International Seminar on Thick Seam Mining, Dhanbad, Mar 4 - 6, 1977

Shri M S Cheema

- (a) ISM Workshop on 'Grading & Internal Assessment', Dhanbad, Nov 23 - 24, 1976
- (b) ISM Golden Jubilee Inter - disciplinary Seminar on Mineral Development in Eastern India, Dhanbad, Dec 5 - 6, 1976
- (c) Seminar on 'Productivity in the Mining Industry' organised by Indian National Mineworker's Federation, Ranchi, Dec 11 - 12, 1976
- (d) ISM Golden Jubilee International Seminar on Thick Seam Mining, Dhanbad, Mar 4 - 6, 1977

(e) ASCI Workshop on 'Management and Coordination of Research',
ISM/Dhanbad, Jan 14 - 16, 1977

6.9 Conferences/Seminars Organised

Despite its limited manpower resources, the Department successfully organised, with cooperation from the sister departments, the ISM Golden Jubilee Inter - disciplinary Seminar on 'Mineral Development in Eastern India' at the Indian School of Mines during Dec 5 - 6, 1976



7 DEPARTMENT OF MINING ENGINEERING

7.1 Academic and field activities

7.1.1 Changes made in syllabus

- (a) A part - time M Tech (Min Engg) Course was designed and approved by BOCS
- (b) The M Tech (Opencast Mining) Course syllabus was modified and approved by BOCS
- (c) The teaching and examination subjects of V year Mining Course was modified and approved by BOCS
- (d) Semester system was introduced for the I Year of the 5 - year B Tech (Min Engg) programme. Steps have been taken to introduce semester system at the II year level also from 1977 - 78 session. The syllabus has been modified and approved by BOCS. The syllabus for III, IV and V year of the 5 year B Tech (Min Engg) programme is also being revised on Semester pattern

7.1.2 Field trips and training

Vocational practical training in mining was arranged for Mining students of I, II, III & IV years for a period of six weeks during the months of May, Jun & Jul 1977. Training was also arranged for the App Geology and App Geophysics students

Field Visits . Educational visits to coal mines in the Jharia and Raniganj coalfields for the IV Yr Mining students were arranged. Visits to boring sites of the G S I were also arranged for III Yr Min Engg students

Visits to metalliferous mines in the Singhbhum belt were arranged for IV yr Min Engg students. The V yr Min Engg students visited metalliferous mines in Khetri, Zawar, Goa, K G F, and Reyveli

The Annual Survey Camp was held in the month of December, 1976 for three weeks for V Yr Min Engg students at Pootkee Colliery. The IV Yr Min Engg students also did 10 days of field work in surveying during the same period. The students were trained in surface and underground techniques including correlation, determination of true North and surface and underground traversing, contouring, triangulation, etc

7.2 Research Activities/Publications

7.2.1 Departmental programme

The Department continued its research interests as in the previous year. Rock strength studies, equivalent - material model studies, thermal conductivity of rock and heat flow studies and cuttability of coal and rock received special attention.

7.2.2 Interdepartmental programme

Work on an interdepartmental research project on "a study of the mechanical properties of roof rocks in relation to their mineral constituents in the coal mines" continued

7.2.3 Sponsored R & D projects

Work was taken up on the following Research projects founded by the GOI Department of Coal from its S & T budget :

- (i) Methane emission and drainage
- (ii) Assessment of Surface movement due to mineral extraction
- (iii) Control ground around extraction perimeter
- (iv) Stability of slopes in open pit mines
- (v) Investigation into problems of rock bursts
- (vi) Heat flow studies for deep mines
- (vii) Evaluation of workability indices of Indian Coal Seams and coal measure rocks

7.2.4 Collaborative Research and work done

The work on 'applicability of hydro - mining' in collaboration with B C C L continued

7.2.5 Post-graduate research

Scholars for M Tech (Min) and Ph D (Min) worked on the following topics :

- (i) Determination of the productivity potential of a longwall face by computer simulation
- (ii) Design of mixing through for hydraulic stowing
- (iii) Planning of an opencast coal mine
- (iv) Subsidence studies in Indian coal mines
- (v) Stability of slopes in openpit mines
- (vi) Heatflow studies in a deep metalliferous mine
- (vii) Hydraulic stowing with crushed stone

7.2.6 Sponsored Research

Work was carried out on the 'Development of a Computer Model for Hydraulic Stowing installation' for B C C L

7.3 Publications

1. Singh R D & Banerjee S P "An Appraisal of antogenous fire hazards associated with the mining of Thick Coal Seams"- Proceedings of International Symposium on Thick Seam Mining, I S M, Dhanbad. Mar 1977
2. Singh R D & Ghose A K "Thick Seam mining methods - A global overview" Proceedings of International Symposium on Thick Seam Mining, Dhanbad, Mar 1977
3. Singh R D "Design of pit top and pit bottom layouts"- Seminar on Transportation in mines, organised by the Institution of Engineers (India), Dhanbad Sub - centre, Jan 1977
4. Singh R D "Scientific exploitation of minerals"- Seminar on Mineral Development in Eastern India, I S M Dhanbad, Dec 1976
5. Singh R D "Deveiopment of a Central R & D and Design Institute for hard rock mining in India"- Proceedings of Seminar on optimum utilization of plant & equipment in Mining Section, sponsored by the Bureau of Public Enterprises, jointly with Mining Geylogical and Metallurgical Institute of India, the Institution of Engineers (India) and the Indian Institute of Mineral Engineers, New Delhi, Feb 1977
6. Ghose A K & Singh R D "Mechanical propertles and work ability indices of Indian Coals", ISM Golden Jubilee Monograph (under publication), 1977
7. Ghose A K "Potential of hydraulic mining and hydroloading for exploitation of Thick Seams in Jharia Coal field - An exploraroty study" - Proceedings of the International Symposium on Thick Seam Mining, Dhanbad, Mar 1977
8. Ghose A K "Strategies for optimal utilization of coal face machinery" - Proceedings of the Natioaal Seminar on "Optimum Utilization of Plant and Equipment in the Mining Industry" New Delhi, Feb 1977

9. Ghose A K "Design of support systems for future Longwall Faces" - An Overview" - Journal of Mines, Metals & Fuels, May 1976
10. Ghose A K & Bagchi S "Environmental impact inventory for the Indian mining industry - A Forecast to the year 2000 and its implications" - Proceedings of the IXth World Mining Congress, Dusseldorf, May 1976
11. Ghose A K & Niyogi H "Planning for development of a high - capacity combined mine for working deep and Thick Seams"- proceedings of the IXth World Mining Congress, Dusseldorf, May, 1976
12. Ghose A K "Technological developments in underground coal mining - An Update" - Published in the 'State of Art Lectures 1976' of the Institution of Engineers (India)
13. Banerjee S P "Instrument for early detection of underground mine fines" - World Instrumentation Symposium New Delhi, Nov 1976
14. Banerjee S P "Gaps in mining machinery" - Commerce, Bombay, 26 Feb 1977
15. Banerjee S P Patnaik N K & Rahim Md. O "Determination of the frictional coefficient of mine airways with Varied Lining and Support Systems"- Journal of Mines Metals & Fuels Jul 1976
16. Banerjee S P & Maung M H "An investigation into strata behaviour around an experimental longwall caving face in Jharia coal fields" - Journal of Mines Metals & Fuels Sep 1976
17. Banerjee S P "Incubation period and other factors affecting spontaneous heating of coal" - Seminar on underground fires coalfield fires, CMPDI, Ranchi Nov 1976
18. Mozumdar B K "Prediction of ground movement due to an advancing face," - CIV APCOM Symposium Penn State University, 1976
19. Mozumdar B K "Surface mining of developed coal Seam" - Proceedings of International Symposium on Thick Seam Mining, Dhanbad, Mar 1977
20. Nagda D S "Instrumentation to measure air velocity in Mines" - Journal of Mines, Metals & Fuels, Nov 1976

Book Writing

1. Singh R D "Principles and practice of mine planning"
(in Hindi) under preparation

7.4 Consultancy Projects

The following projects were completed :

- (1) Slope Stability at Meghataburu Iron Ore Opencast Mine (in hand)
- (2) Study of gassiness of top seam at Swang Colliery
- (3) Ground Vibration due to deep hole blasting at Chasnala Colliery
- (4) Investigation due to ground vibration at Bankola Colliery, E C L
- (5) Site investigation at Barakar Bridge, Phase - V
- (6) Drilling studies on rocks from Jhingurdha project
- (7) Site Investigation at Barakar Bridge Phase - IV
- (8) Site investigation at Telmuchu Bridge Phase - II

7.5 Testing Services

The following testing services were provided :

- (1) Calibration of Load cells for M/s Progressive Machine Tools, Jaunpur (U P)
- (2) Testing of Coal Samples for East Katras Colliery of B C C L
- (3) Testing of Rock/Coal Sample for Kenduadih Colliery of B C C L

7.6 Guest lectures :

The following guest lectures were delivered in the Departments' Golden Jubilee series :

- | | | | |
|-----|---|---|--------------|
| (1) | Shri S K Bose
Joint Secretary to the
Govt of India
Deptt of Coal
Ministry of Energy | "Exploitation of
developed coal
pillars - Indige -
noous technology" | Oct 28, 1976 |
| (2) | Shri I M Aga
Dy Adviser (P/M)
Bureau of Public
Enterprises
Ministry of Finance | "Development of
metalliferous
mining Industry in
India | Nov 17, 1976 |
| (3) | Shri M A Khan
Dy General Manager
Hindusthan Copper Ltd | "Development of
copper deposits -
strategy for future | Nov 19. 1976 |

(54)

- | | | | |
|-----|--|---|--------------|
| (4) | Shri R N Sharma
Vice - Chairman &
Managing Director
B C C L | "Organisational
structure of the
Coal Industry" | Nov 25, 1976 |
| (5) | Shri A N Banerjee
Chairman - Managing
Director
Bharat Aluminium Co Ltd | "Absorption of
technology" | Dec 1, 1976 |
| (6) | Shri S Bagchi
Director
Central Mining Research
Station | "Combating of
mine fires hazard
in Indian coal mines" | Dec 5, 1976 |
| (7) | Dr S S Saluja
Director, Institute of
Technology
Banaras Hindu
University | "Air - lift pumping and
its emergency
application incase
of flooding of mines" | Dec 10, 1976 |

7.7 Participation in seminars, Conferences etc.

Professor R D Singh

- (a) Seminar on "Optimum utilization of plant and Equipmemt in the mining industry" organised by Bureau of Public Enterprises, New Delhi. Feb 9 - 11, 1977
- (b) Colloquim on "Explosives" organised by the Insiitution of Engineers (India) - Dhanbad Sub - centre, Jul 26, 1976
- (c) 6 - day Mini Seminar on Hindi terminology for Metalliferous Mining I S M, Jan 1977.
- (d) Seminar on "Transportation in mines and Bihar Coalfields" - organised by the Institution of Engineers (India) - Dhanbad Sub Centre, Jan 23 - 24 1977
- (e) Seminar on "Mineral development in Easteran India" - I S M Dhanbad, Dec 5 - 6, 1976

Professor S D Singh

- (a) Interdisciplinary seminar on "Mineral development in Eastern India" I S M, Dec 5 - 6, 1976
- (b) Mini Seminar on Hindi terminology for metalliferous mining, I S M, Jan 18 - 27, 1977
- (c) Seminar on "Quality Teaching in a University with reference to I S M" organised by I S M Teachers Association, Apr 25, 1977

Professor A K Ghose

- (a) "IX World Mining Congress", Dusseldorf, May 20 - 28, 1976
- (b) International Symposium on Thick Seam Mining", I S M Dhanbad March 4 - 6, 1977
- (c) Seminar on "Optimal utilization of plant and machinery in the mining industry", New Delhi, Feb 7 - 8, 1977

Professor S P Banerjee

- (a) National seminar on "Instrumentation & automation in mining industries" I S M, Nov, 1976
- (b) Symposium on "Mine Fires", organised by CMPDI, Ranchi, Nov 15 - 16, 1976
- (c) "World Instrumentation Symposium" organised by WISITEX New Delhi Nov 22 - 28, 1976
- (d) Workshop on "Management of the Future" organised by ASCI, Hyderabad, Oct 18 - 21, 1976
- (e) "International Symposium on Thick Seam Mining" organised by the Department of Mining Engineering, I S M, Mar 1977

Professor B K Mozumdar

- (a) National Seminar on "Opencast Mining", Neyveli, Apr, 1976
- (b) "International Symposium on Thick Seam Mining", ISM Mar 1977
- (c) ASCI Workshop on "Management and coordination of Research", I S M, Jan 14 - 16, 1977

Shri P R Prasad

- (a) Seminar on "Quality Teaching in a University with reference to I S M" organised by I S M Teachers Association, Apr 25, 1977

Shri N K Patnaik

- (a) ASCI Workshop on "Management and coordination of Research" I S M, Jan 14 - 16, 1977
- (b) Seminar on "Mineral development in Eastern India" I S M, Dec 5 - 7, 1976

Shri D S Nagda

- (a) "International Symposium on Thick Seam Mining, I S M, Mar, 1977

7.8 Conference organised

As a Part of the Golden Jubilee celebrations, the Department organised an International Symposium on Thick Seam Mining during Mar 4 - 6, 1977. It was inaugurated by Shri K S R Chari, Coal Secretary who in his address emphasised the important role of the coal mining industry in the Energy Sector of India and the role of switching over to longwall mining for extraction of Thick Seam. 25 Papers, including six by foreign authors including from the U K, France, U S A, Yugoslavia and Poland were presented and discussed in eight technical sessions spread over two days. About 250 delegates, including some from Poland and England participated in the Symposium. All papers drew lively discussions and helped in up - dating knowledge about the current status of thick seam mining the world over. The symposium ended on a lively note with the closing address of Shri R N Sharm, Vice - Chairman cum Managing Director of Bharat Coking Coal Limited.

7.9 Membership on Committees, etc

Professor R D Singh

- (a) Council Member, Mining Geological and Metallurgical Institute of India
- (b) Member, Subpanel in Mining Engineering, Central Hindi Directorate, Mining of Education, New Delhi
- (c) Member, Mining Sectional Committee (EDC 50) of Indian Standards Institute
- (d) Member, Committee of Experts for M Tech Programme in Rock Mechanics, I I T, New Delhi
- (e) Member, U G C Visiting Committee to examine the development needs of College of Engineering & Technology, Osmania University
- (f) Member, Paper Awards Committee (Coal Mining) of Mining Geological and Metallurgical Institute of India
- (g) Convenor, Committee for revision of Diploma Syllabus in Mining Engineering appointed by Joint Board on Mining Engg Education and Training, Ministry of Energy
- (h) Judge for the I E Dhanbad Sub - centre awards for papers
- (i) Member, several selection committee of C M R S

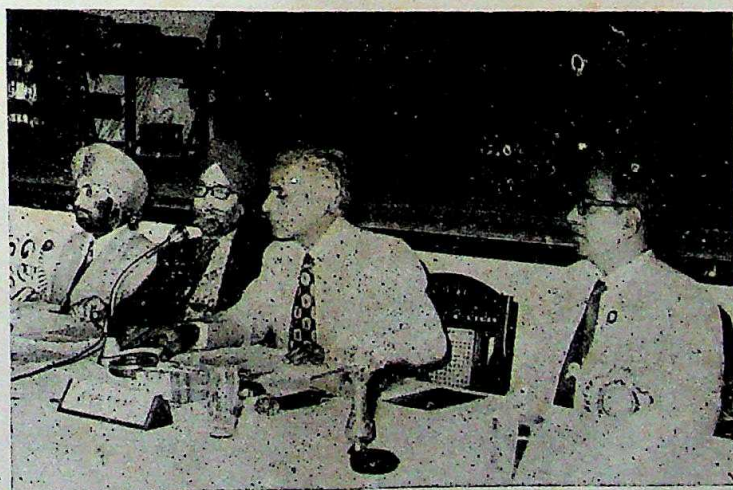
Professor A K Ghose

- (a) Chairman, Mining and Metallurgy Division, Institution of Engineers (India) and Member of the National Council

INTERNATIONAL THICK SEAM MINING SYMPOSIUM



From l to r: Shri K S R Chari, Prof G S Marwaha and Prof R D Singh during inauguration of the symposium.



From l to r: Shri Asa Singh, Prof G S Marwaha, Shri R N Sharma and R D Singh during concluding session.

(57 .)

- (b) Chairman, Dhanbad Sub - Centre, Institution of Engineers (India) since January, 1977
- (c) Member, Examination Committee, Institution of Engineers (India) upto March, 1977
- (d) Member of the study group on "Ecological Problems of Opencast and Underground Coal Mines" set up by Ministry of Energy, Govt of India
- (e) Expert witness at the statutory Court of Enquiry appointed to enquire into the accident at Kessurgarh Colliery
- (f) Member of the Committee to enquire into the subsidence at Kenduadih Colliery
- (g) Member of Council, Mining, Geological and Metallurgical Institute of India
- (h) Hony Editor, Journal of Mines, Metals and Fuels, Calcutta

Professor S P Banerjee

- (a) Member, Executive Committee, Institution of Engineers (India) Bihar Centre and Dhanbad Sub - centre
- (b) Council Member, Mining Geological and Metallurgical Institute of India

7.10 Training within India and abroad

Professor R D Singh

Attended a 2 - week residential programme on "Personnel Administration for Non - Personnel Executives" Aug 2 - 5, 1976, NITIE, Bombay

Visited the Academy of Mining, Krakow and other institutions in Poland for 4 weeks commencing Mar 14, 1977, under the Indo - Polish Cultural Exchange Programme

Professor A K Ghose

4 - week study visit to Poland and West Germany from Mar 14, 1977

Professor S P Banerjee

Visited Poland (AGH, Krakow) under the Indo - Polish Cultural Exchange Scheme for one month in Jan - Feb 1977

Professor B K Mozumdar

Studied planning of Opencast Projects at CMPDI Ranchi

Shri N K Patnaik

Attended a 2 - week residential programme on "Occupational Safety and Health" at NITIE Bombay from Feb 21, 1977

7.11 Purchase of equipment

The undermentioned equipment was purchased and received in the Department during the year :

- (a) Dial snap gauge
- (b) Extensometers of various kinds
- (c) Digilog XY recorder
- (d) Grinding and polishing machine
- (e) Field shear box
- (f) Sound level meter
- (g) Dial gauges
- (h) Wet & Dry Bulb temperature recorder
- (i) Vee Block for testing
- (j) Hydraulic jack
- (k) Flat jacks apparatus
- (l) Aneroid barometer and physical weight boxes



8 DEPARTMENT OF PETROLEUM ENGINEERING

Some highlights

The year witnessed the metamorphosis of the Department of Petroleum Technology into that of the 'Department of Petroleum Engineering'. A very significant *first - ever* "National Petroleum Symposium on Improved Oil Recovery Techniques", sponsored by the U G C, was inaugurated by Dr N B Prasad, Chairman / ONGC. Key-note Addresses were delivered by a galaxy of speakers led by Shri S B Budhiraja, Managing Director / Indian Oil Corporation (marketing Division). The Department also took up the challenge of conducting *simultaneously* (1) a 3 - month Refresher course in Petroleum Engineering for ONGC and Oil India executives (some with field experience ranging upto 18 years), which has since been completed as a success, and (2) a one - year 'Post - Graduate programme in Petroleum Reservoir Engineering' for the Graduate Trainees of ONGC, meant for the new ONGC Institute of Reservoir Studies coming up at Ahmedabad with French collaboration. About 30 lectures by Guest Lecturers were also organised by the Department during the year under review

In addition to the Departmental / Inter - departmental research projects on hand, negotiations were initiated with O N G C for sponsored research and three problems have already been identified after mutual discussion

ISM's Golden Jubilee year has thus been a 'golden year' of tremendous achievements and prospects for the Department of Petroleum Engineering

8.1 Academic and field activities

8.1.1 Changes made in syllabi

The revised curriculum approved by the ONGC - ISM - Ministry of Education Committee set up by the 'Planning Commission, with increased stress on engineering subjects, which was introduced at the I year level in 1973 - 74, was implemented during this session at the IV year stage. Incidentally all the seven IV year P.E students passed their B Tech (Petroleum Engineering) Part I examination with FIRST CLASS HONOURS.

8.1.2 Field trips and training programme arranged

(1) The IV year P E students visited petroleum industry installations (IOBL/IOC, etc) in and around Calcutta during December 1976. The V year P E students undertook an educational tour of the Institute of Petroleum Exploration of ONGC, the Indian Institute of Petroleum, the Photogeological Institute, and the various Directorates/Sections of ONGC at Dehradun during Dec '76 - Jan 1977

(2) The 3 - month Refresher Course participants visited CFRI, CMRS and FCI, Sindri

(3) The II year P E students underwent four weeks of training on the IPE Model Training Drilling Rig at Dehradun. The III year P E students took six weeks of Drilling and Production training at the Ankleshwar Project of the ONGC. The V year P E students had six weeks of Production training with the Assam Oil Co at Digboi, Oil India Ltd at Dulaijan, and in the ONGC Eastern Region operations. These varied and comprehensive training programmes were worked out in collaboration with the Petroleum industry to add the practical field - touch to the academic coverage given in the courses

8.2 Research activities

8.2.1 Departmental Research Programme

Work was started on the following projects

(1) "Studies on some crude oils from Indian oil fields with special reference to Paraffin and foaming problems" by Shri B Rameshwar, under the guidance of Prof S Srini - Vasani and Prof N V R Subrahmanyam

(2) "Studies on oilfield emulsions" by Shri J R Murthy, under the guidance of Prof N V R Subrahmanyam

(3) "Oxidative and thermal degradation of polymers" - by Shri S N Das, under the guidance of Dr B P. Pandey

(4) "Secondary Recovery of oil by polymer flooding" - by Shri N C Dey, under the guidance of Dr S K Bajjal and Shri G S Mony

(5) "Permeability studies in gravel packing" - by Shri G S Mony, Asstt Professor

8.2.2 Interdepartmental programme

A project on use of phosphate slm as additive in Drilling of Geothermal and Super deep wells, has been taken up by Shri S K Sengupta of PE Deptt jointly with Shri Subba Rao of Mineral Engg and Prof S Srini - Vasani

8.2.3 Collaborative research

The following collaborative are in hand

- (1) 'Development of a two dimensional three phase petroleum reservoir computer simulation model' by Shri C Ratnam, Chief Geologist/Oil India Ltd, under the joint guidance of Prof S Srin - Vasam and Dr K V V S N Murty (of OIL)
- (2) 'Evaluation of Indigenous gravels for gravel packing' by Shri Satinder Kumar, IPE / ONGC under the joint guidance of Prof S Srin - Vasam and Shri S N Talukdar, DIR/IPE
- (3) 'Tertiary Oil Recovery by Surfactant flooding' by Shri R K Gupta. IPE/ONGC, under the guidance of Prof S Srin - Vasam
- (4) 'Performance evaluation and prediction of combination drive reservoirs' by Shri B B Singh, ONGC, under the joint guidance of Prof S Srin - Vasam and Dr Inderjit Singh of ONGC

8.2.4 Sponsored research

Preliminary work has been started on the following projects being negotiated for ONGC sponsorship

- (1) "Deparaffination, of surface and subsurface strings by use of ultrasonics" by Shri Hazra under the guidance of Dr B P Pandey and Prof S Srin - Vasam
- (2) "Petrophysical properties of rocks - uncertainties in determination of porosities of shale and shaly sands - causes and solutions" under the guidance of Shri G S Mony

8.3 Publications

Research articles published

Prof S Srin - Vasam

- (1) 'Status of Automation in off shore oilfield operations in India'. (Prof of IFAC/IEIP Symposium on Automation in Offshore oilfield operations, Bergen Norway Jun 14 - 17, 1976) - jointly with Shri A K Mitra
- (2) 'Status Report on Improved oil recovery/enhanced recovery methods' (I S M Golden Jubilee National Petroleum Symposium on Improved Oil Recovery Techniques, Dhanbad, Nov 1976)
- (3) "Review of some factors to give increased oil recovery by formation fracturing and acidising" (Ibid) - jointly with Shri G S Mony
- (4) 'Petroleum Engineering, a challenging profession and the ISM Petroleum Engineering Course' (Metals and Mining Review, Dec 1976)

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(5) 'New Technology required for offshore exploitation of our petroleum Resources' (Symposium on Challenges before the chemical industry, B T P S, Pilani, Feb 1977)

Prof N V R Subrahmanyam

(6) 'Mechanism of displacement of fluids in Secondary oil Recovery' (ISM Golden Jubilee National Symposium on Secondary Oil Recovery Techniques', Dhanbad, Nov 1976)

(7) 'Petroleum Resources of North - eastern India : Prospects and Problems' (I S M Golden Jubilee Inter - disciplinary Seminar on Mineral Development in Eastern India, Dhanbad, Dec 1976)

(8) 'Methods in Teaching Technology' (I S M Golden Jubilee Seminar on "Quality Teaching in a University with reference to ISM", Dhanbad, Apr 1977)

(9) 'To teach or not to teach : The Agony and the Dilemma' (Ibid)

(10) 'How to Reckon Teaching' (Ibid)

Dr B P Pandey

(11) 'Evaluation of the Capillary pressure curve techniques for determining pore size distribution - A network approach' (Powder Technology : 15 - 1976, 89 - 96) - jointly with A K Singhal

Shri G S Mony

(12) "Secondary Recovery of oil by polymer flooding" - a discussion of the paper by D D Spartin 'An Evaluation of Polyacrylamides for reducing water production', based on data worked in the ISM PE laboratory on the problem, accepted for publication in Aug 1977 issue of Journal of Petroleum Technology by SPE/AIME)

8.4 Special courses offered

8.4.1 A 3-month - Referesher Course in Petroleum Engineering was conducted by the Deptt of Pet Engg for Production Executives of the O N G C and the Oil India Ltd, from Apr 20 to Jul 15, 1977. The course was inaugurated by Shri H G T Woodward, Officer on Special Duty (Production) / O N G C, Nineteen Exec Engineers and Asstt. Exec Engineers of ONGC and two Executives of OIL participated in the full - time residential course organised at ISM. Out of the 400 lectures and practicals arranged, about 345 were taken by ISM staff members and the remaining by officers of ONGC/OIL/DGMS to provide oil industry/oilmines regulatory - body

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participation, as desired by the indentors of the course. The academic, practical and field aspects were fully covered by the ISM and guest lecturers. The participants also had opportunity for interaction time through seminars, etc. Special lectures, films and technical visits to CFRI/CMRS/Sindri FCI plant, etc, were also arranged. Excursions to Maithon Dam and Topchanchi gave the necessary environmental appreciation touches.

The course ended on Jul 15, 1977 with a Valedictory function, where Dr D K Chandra, Deputy General Manager/ONGC, was the Chief Guest.

8.4.2 A one - year Post - Graduate Course in Petroleum Reservoir Engg for Graduate Trainees of ONGC was taken up by the Deptt as a full - time residential course. During the 1st term vacations, these graduate trainees, 22 in number, will be visiting oilfields and research institutes to observe field problems and the status of actual achievements there. This course was inaugurated by Shri A P Ghosh, Joint Director (Training) / ONGC, on May 4, 1977. On successful completion of this one - year course, these Graduate Trainees are expected to be assigned to the IRS (Institute of Reservoir Studies) / ONGC at Ahmedabad, which is taking shape with French collaboration.

8.5.1 Consultancy projects

An interdisciplinary project on "Feasibility of Production of Oil Mining in AOC Operations" is expected to be taken up in collaborative with the ISM Deptt of Min Engg

8.5.2 Testing services

The porosity and permeability of Chasnalla coal samples were determined, on behalf of the Chasnalla Colliery disaster Court of Enquiry

8.5 Guest lectures

Twenty - seven guest lectures were arranged by the Deptt of Pet Engg, as below :

8.6.1 Golden Jubilee Lectures arranged under the auspices of ISM Petroleum Engg Society

Sl. No.	Name of Lecturer	Organisation	Topic of lecture
1	Shri A N Sriramulu, Dy Director (Reservoir)	Bombay offshore Project, ONGC	Some problems of development of lime- stone reservoirs.

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Sl. No.	Name of Lectures	Organisation	Topic of lecture
2	Shri P N Singh, Executive Assistant to Managing Director	IGC (Mkt Divn) Bombay	Indian Oil Corpora- tion its intake proce- dure and marketing operations
3	Shri S P Kapoor Sr Technical Adviser	Oil India Ltd, New Delhi	Oil & gas pipelines
4	Dr M M Mehta	Data Electronics Combine, New Delhi	Mathematical simu- lation of water - con- ing and its remedial measures

8.6.2 Special Golden Jubilee

Sl. No.	Name of Lecturer	Organisation	Topic of lecture
1	Dr M G Krishna	Director C F R I	Energy crisis - models for management
2	Shri S V Desikachar	Suptdg Geologist O N G C	Hydrocarbon poten- tialities of India - an overview
3	Dr V S Aithal	Suptdg Geophysicist, O N G C	Role of geophysical exploration for oil
4	Shri M A Ganapathy	Chief Geophysicist, (Tech), I P E	Development of instru- ments for geophysical survey and well logging
5	Shri S N Talukdar	Director, Inst of Pet Exploration, O N G C	Role of R & D in oil industry
6	Shri K L N Rao	Suptdg Geologist, Bombay Offshore Project, O N G C	Exploration of Bombay - High - A challenge and the tasks
7	Shri S K Chawla	Sr Dy Director (IE) O N G C	Manpower planning
8	Shri N K Talukdar	Jt Director (Finance) O N G C	Performance budgeting

(65 .)

Sl. No.	Name of Lecturer	Organisation	Topic of lecture
9	Shri S N Ghosh	Director, Bureau of Petroleum and Chemical Studies, and Editor/Publisher 'Oil Commentary'	The road to a new society

8.6.3 Other guest lectures

Sl. No.	Name of Lecturer	Organisation	Topic of lecture
1	Shri S Aditya	Head, Basin Studies Group, IPE	Sedimentary basins of Indian - Framework and hydrocarbon potentialities
2	Shri V K Arrora	Chief Drilling Engineer, O N G C	Oil - well drilling in India, progress and problem
3	Shri Raja Ram	Dy Suptdg Geophysicist, O N G C	Application of well logging methods in O N G C
4	Dr Inderjit Singh	Addl Director (Reservoir) O N G C	Reservoir engg practices and problems in ONGC oil - fields
5	Shri U B Acharya	Sr Reservoir Engineer, O I L	Application of reservoir simulation to production practices in OIL
6	Shri U B Kadam	Sr Dy Director (Prodn), O N G C	Oil well production practices & problems in O N G C
7	Shri K Z N Ahmed	Sr Prodn Engineer, O I L	Oil well production in practices & problems in OIL
8	Dr K V V S N Murty	Technical Adviser, O I L	Well workover operations in OIL A review
9	Shri B V Prabhakar	Sr Dy Director (Prodn) O N G C	Pressure maintenance & artificial lift methods in O N G C

(66)

Sl. No.	Name of Lecturer	Organisation	Topic of lecture
10	Shri B D Dutta	Actg Chief Geologist O I L	Secondary recovery of oil in OIL
11	Shri P N Sethi	Senior Marketing Officer, O N G C	Marketing of natural gas
12	Shri R N Mitra	Sr Dy Director (IE), O N G C	Petroleum exploration economics
13	Shri S K Chawla	Sr Dy Director (IE), O N G C	Personnel for the petroleum industry
14	Shri S P Gupta	Joint Director of Mines Safety, D G M S	Oil mines safety regulation

8.7 Attendance/participation in seminars, conferences, workshops

Prof S Srini - Vasan

- (1) Seminar on Himalayan Geology, New Delhi, organised by GSI, ONGC and Min of Petroleum and Chemicals, Sep 1976
- (2) Workshop on Grading and Internal assessment, ISM, Nov 23 - 24, 1976
- (3) National Petroleum Somposium, ISM, Nov 27 - 29, 1976
- (4) Seminar on Quality Teaching, ISM, April 25, 1977

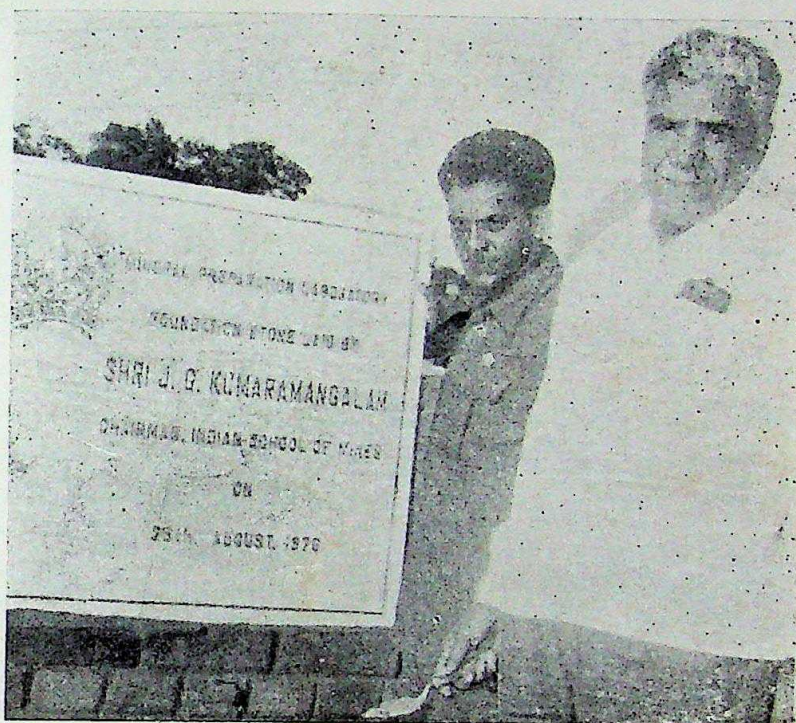
Prof N V R Subrahmanyam

- (1) Seminar on Himalayan Geology, New Delhi, organised by G S I, O N G C and Min of P & E, Sep 1976
- (2) G J Interdisciplinary Seminar on Mineral Development in Eastern India, ISM, Dec 1976
- (3) ASCI Workshop on 'R & D Project management and coordination' Jan 14 - 16, 1977
- (4) Seminar on 'Quality Teaching in a University, with special reference to ISM', Apr 1977

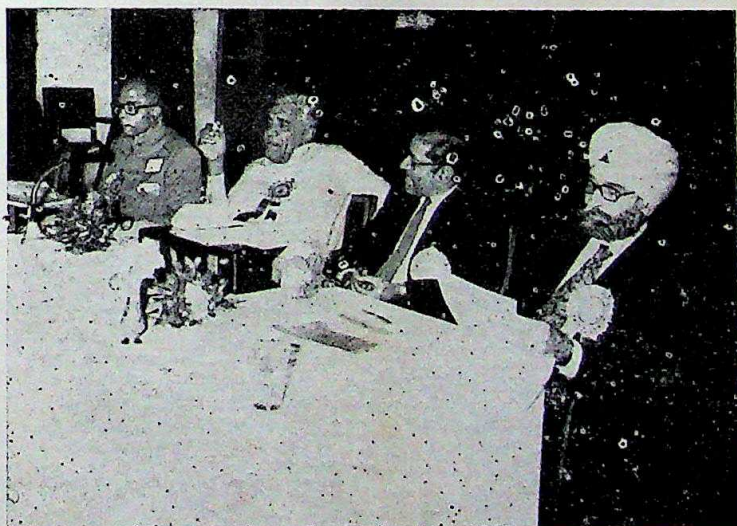
Dr B P Pandey

The 3 day Golden Jubilee National Sumposium on "Improved Oil Recovery Techniques", ISM, Nov 27 - 29, 1976

Shri J G Kumaramangalam laying the foundation stone of Mineral Preparation Laboratory.



PETROLEUM TECHNOLOGY SEMINAR



From L to R : Prof S Srinivasan, Shri J G Kumaramangalam,
Shri N B Prasad and G S Marwaha

Shri G S Momy

- (1) Workshop on 'Grading and Internal Assessment', ISM, Nov 23 - 24, 1976
- (2) Golden Jubilee National Symposium on 'Improved Oil Recovery Techniques', ISM, Nov 27 - 29, 1976
- (3) ASCI Workshop on 'Management and Coordination of Research', ISM, Jan 14 - 16, 1977
- (4) 'Quality teaching', ISM, Apr 25, 1977

Shri S K Sen Gupta

The Golden Jubilee National Symposium on Improved Oil Recovery Techniques, ISM. Nov 27 - 29, 1976

8.8 Conferences organised

The Department of Pet Engg organised, as part of the ISM Golden Jubilee activities, a National Petroleum Symposium on 'Improved Oil Recovery Techniques' with assistance from the University Grants Commission. The symposium was attended by about 70 delegates from the Oil & Natural Gas Commission, the Oil India Ltd, the Assam Oil Co, The Indian Oil Corporation (Mkt Divn), the French Petroleum Institute, academic staff from various Universities Petroleum Press companies dealing with petroleum industry

The symposium received an inspiring message from Shri K D Malaviya, the then Union Minister for Petroleum and Chemicals, congratulating the Deptt for organising this topical symposium of crucial importance to the Indian Oil Industry and the country at a very appropriate time, and expressing the hope that it will be able to arrive at and make recommendations for improving the recovery of representatives and petroleum in India.

After the presentation, discussions and due deliberations of about 30 papers (including two papers from the U S A), conclusions were drawn up and communicated to the Union Minister for Petroleum and Chemicals.

Prof S Srinivasan was the Symposium Coordinator, and Prof N V R Subrahmanyam was the Symposium Convenor

8.9 Training in india or abroad

- (1) Dr B P Pandey completed Ph D programme in Chemical Engg under O I T at I I T/Kanpur, in Oct 1976 and was awarded the degree in Mar 1977

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(2) Dr B P Pandey attended a 2 - month training programme in Laboratory glass blowing techniques at I I T / Kanpur during Dec 75 - Apr 76

(3) Shri H K Mukhopadhyay is pursuing M S/Ph D studies in Pet Engg at the University of Tulsa, U S A

8.10 Membership on Committees, etc

Prof S Srinivasa - Vasana

(a) Member, Executive Committee, Institution of Engineers (India) Dhanbad Subcentre

(b) Regional Convenor, American Institute of Mining, Metallurgical and Petroleum Engineers

(c) President and Faculty Sponsor, A I M E (USA) - I S M Chapter

Prof N V R Subrahmanyam

Member, Advisory Committee on 'Manpower Planning in Petroleum Sector Phase II (Exploration and production of Crude oil)', IAMR, New Delhi



9 DEPARTMENT OF PHYSICS AND MATHEMATICS

9.1 Acadmic and field activities

9.1.1 *Changes in syllabus*

- (a) New syllabus in Mathematics and Statistics was drawn up for the M Sc Tech programme in Mineral Expl
- (b) New syllabus was drawn up in Mathematics for the M Tech (Open - cast Mining) programme
- (c) With the introduction of Semester system in the I and II year classes, the Physics and Mathematics syllabi had to be slightly enlarged as more teaching time was available for these subjects. The syllabi of other courses were periodically reviewed but no changes were considered necessary.

9.1.2 *Field trips and training Programmes*

An excursion to Parasnath Hill was conducted for I year students to determine the height of the hill from Boiling Point obsarvation.

9.2 Research activities and publications

9.2.1 *Departmental programme*

The research activities of the Department during the year under review were centred round the following problems

- (1) "Propagation of elastic waves in layered media" by Shri P C Paul under the guidance of prof K R Nag
- (2) "Effect of initial stress in waves, fracture and yield" by Shri S K Addy under the guidance of Dr S K Dey
- (3) "Non - Locality of nuclear forces and its applications" by Shri D K Sen under the guidance of Dr M L Chaudhury
- (4) "Spectroscopic studies of some aromatic molecules" by Shri K K Sharma under the guidance of Dr G Joshi
- (5) "Spectroscopic studies of some diatomic molecules" by Shri M P Verma under the guidance of Dr B L Jha

9.2.2 *Sponsored research*

An Electronic Commission sponsored research project on 'Design and construction of electromagnetic flaw detector for wine ropes has been taken up by Shri D Chandra and Shri S Rangachari in collaboration with Shri D K Mitra, Asstt Prof of Electrical Engineering. Considerable progress in the development of circuitary has already been made.

9.2.3 Doctoral work

Shri A Chattopadhyay, Scientific Assistant in Mathematics, has submitted a theses entitled "Some problems on Elastodynamics" to the Viswabharati University for the award of the Ph D degree.

9.2.4 Research publications

(1) Dr K R Nag and P C Paul "The Axisymmetric Distrbance due to the porpagation of shearing stress discontinuity in a Semi - infinite Elastic medium". (Applied seientific Research, Netherland) (Communicated)

(2) Dr K R Nag and P C Paul "Disturbance of SH - type due to shearing Discontinuity at the interface of two layers overlying a semi - infinite medium". (Archives of Mechanics, I F T R, Poland) (Communicated)

(3) Dr K R Nag and P C Paul "Disturbance of SH - type due to shearing stress discontinuity in a layered half - space". (Geophysics Research Bulletin, N G R I, Hyderabad) (Communicated)

(4) Dr B L Jha and M P Verma "A New Band system of Diatomic Cadmium Iodide in Ultra - Violet region". (Indian Journal of Pure and Applied Phyaics, New Delhi) (Communicated)

(5) Dr S Dey and S K Addy "Propagation of Love Waves under initial stress in a viscoelastic medium overlying an elastic space". (Accepted for publication in Physics of the Earth and Planatary interiors, Elsevier publication, New Castle upon Tyne, United Kingdom)

(6) Dr S Dey and S K Addy "Reflection of plane waves under initial stress at a free surface" (Accepted for publication in International Journal of Non - Linear Mechanics, Pergemann Press, M I T, U S A)

(7) Dr S Dey and S K Addy "Internal Instablity in Second order elasticity". (Accepted for publication in Journal of Pure and Applied Mathematics, Indian National Science Academy, New Delhi).

(8) Shri B K Kar and A Chattopadhyay "Note on the propagation of Love - type Waves in a heterogeneous medium lying between two Semi - infinite Homegeneous Elastic Media". (Communicated to Acta Geophysics Polonica)

(9) Shri B K Kar and A Chattopadhyay "On the propagation of Love - type Waves in a Non - homogeneous internal stratum of Finite Thickness lying between two Semi - infinite Isotropic Elastic Media". (Accepted by Ger Beit Zur Geophysik)

- (10) Shri B K Kar and A Chattopadhyay : On the Dispersion curves of Love - type Waves in an Internal Stratum of Finite Thickness under initial stress lying between two Semi - infinite Isotropic Elastic Media". (Communicated to Ger Beit Zur Geophysik)
- (11) Shri P R P Rao . "Particular solutions of the linear homogeneous differential equation of the second order". (Communicated to the Journal of Differential Equations)
- (12) A Chattopadhyay "On the Generation of C-type Waves". (Communicated to Acta Geophysics Polonica).
- (13) A Chattopadhyay "On the Strong SH Motion in an transversely isotropic layer lying over an isotropic elastic material due to explosions". (Communicated to Acoustical Society of America)
- (14) A Chattopadhyay "On the Signal recorded at a large distance from explosions within the earth". (Communicated to the Proceeding of Vibration Problems)
- (15) A Chattopadhyay "On the Strong SH - motion in transversely isotropic layer of non - uniform thickness lying over an isotropic elastic material due to explosions". (Communicated to the Journal of Applied Mechanics)

9.3 Short courses offered

The Department organised its first Short Course on "Mathematical and Statistical Methods in Mineral Industry" from Apr 19 to May 1, 1977. The course was attended by participants from E C L, C M R S, C M P D I (Ranchi), Hindusthan Zinc Ltd, and Maganese Ore (India) Ltd, in addition to four staff members of the institution itself.

The course was so well received that the Department was called upon to repeat the course, this was done from Jul 26 to Aug 7, 1977. Participants in the second course came from E C L, B C C L, MECON and C M P D I.

9.4 Guest Lecturers :

Golden Jubilee Lectures on 'Rocketary and Space Engineering' were delivered by Prof G B Pant, Hony Consultant, B I T/Mesra, on Feb 28 and Mar 1, 1977

9.5 Attendance/participations in seminars :

- (a) Some of the staff - members of the Department attended and participated as delegates in

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(i) the ISM Golden Jubilee National Seminar on "Mineral Development in Eastern India" organised by the Deptt of Ind Engg and Management, Dec 1976

(ii) the ISM Golden Jubilee National Seminar on "Improved Oil Recovery Techniques" organised by the Deptt of Pet Engg Nov 1976

(b) Both the Professors and two other teachers of the Department attended the Training Workshop on 'Grading and Internal Assessment' organised by ISM on Nov 23 - 24, 1976

(c) The two Professors of the Department attended the ASCI Workshop on "Management and Coordinations of Research" organised by the School on Jan 14 - 16, 1977

(d) Shri M P Verma attended a Short Course on Glass Blowing at I I T / Kanpur, during Feb 16 - Mar 21, 1977

9.6 Training within India

Shri K D Gupta, Instructor, continued to work for the M Sc degree in Physics (with Electronics as special paper) at the K N Govt Post - Graduate College, Gyanpur, Varanasi.

9.7 Purchase of Equipment

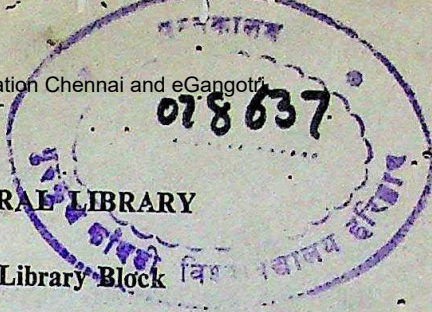
The following major items of equipment were purchased during the year :

Oscilloscope with accessories, Gamma ray Spectrometer and accessories

Electronic Desk Calculators for numerical computation

Photographic equipment and camera

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10 CENTRAL LIBRARY

10.1 Formal Opening of the new Library Block

The new premises to which the Library shifted in 1975 was formally declared open on Aug 26, 1976, by prof Satish Chandra, Chairman, U G C, in a simple and sober ceremony. The distinguished guest was taken around to various sections of the Library and was shown the modern procedures that have been adopted for the management of the Library

10.1.1 Clearing of arrear work

The Rs One Lakh - Project' given on contract basis to the Bengal Library Association to complete the technical processing of accumulated documents continued till March, 1977. The number of documents processed in this project (which was taken up in Feb, 1976) was 24,232 at a cost of Rs 96,928/-

10.2 User facilities

To facilitate easy location and identification of documents in the Library, classified catalogues, supported by alphabetical author, title index and subject index has now been provided. Periodical holdings have also been provided for the location of back volumes of journals

10.3 Finance

Besides a maintenance budgetary grant of Rs 180 lakhs, the library had the benefit of a grant of Rs 240 lakhs from U G C for purchase of books and journals during the year. Still, the mounting cost of documents has been a problem to contend with

10.4 Acquisition

The total number of documents, including bound back - volume journals and old pamphlets, accessioned during the year was 7,599. The total number of journals subscribed during the year was 343

10.5 Reprographic Work

The reprographic facilities have been of service not only to teachers and research scholars but also to final year students in getting materials relevant to their project work. Further expansion of facilities in this section will be possible with the procurement of a complete microfilming unit costing about Rs 3 lakhs. An all purpose microfilm reader has already been procured. A Photographic Document Contact Printer machine has also been purchased for document reproduction work

10.6 Staff position

There was considerable improvement in the staff position. An Assistant Librarian, two Professional Asstts and two Semi - Professional Asstts joined during the year

10.7 Assistance to students through library work

To enable deserving/desirous students to 'earn while they learn' a scheme was introduced during 1976 - 77 in the Central Library under which the students helped in the library work during their off - hours, and remuneration was given to them for such assistance. During 1976 - 77, 62 students took advantage of the scheme

10.8 Book exhibition

A large Book Fair was organised along with the Industrial Exhibition in Dec 1976 as a part of the Golden Jubilee celebrations of the School. The British Council/Calcutta, Indian Bureau of Mines/Nagpur, Geological Survey of India/Calcutta, UNESCO and other renowned publishers like Wiley, UBS/Vikas, Orient Longman as well as several book suppliers participated in the Book Fair.

10.9 Training programme

An in - house training programme on 'Circulation Work in Library - Charging and Discharging methods' was organised for the Departmental Assistants looking after the Departmental Libraries. The participants from the following departments attended the courses :-
 (1) App Geology (2) App Geophysics (3) Chem, Fuel & Metallurgy
 (4) Humanities and Social Sciences (5) Physics and Mathematics
 (6) Min Engineering and (7) Pet Engineering.



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1898-2000

